NOVEMBER 1, 1992
VOLUME SIX NUMBER THREE
SEVEN DOLLARS

CIO

THE MAGAZINE FOR INFORMATION EXECUTIVES

COVER STORY:

How Customer Links Are Forging New IT Alloys

ALSO INSIDE:

Client/Server Status Report

Bethlehem Steel's
Walter Bargeron

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CIO

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Cover photo by Eugene Mopsik

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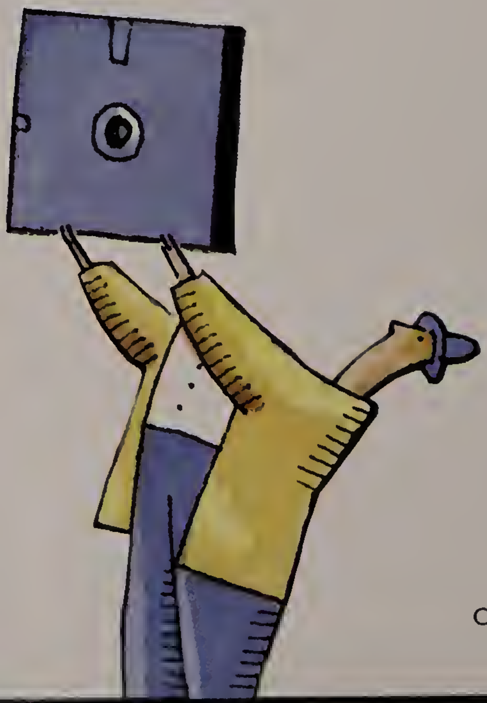

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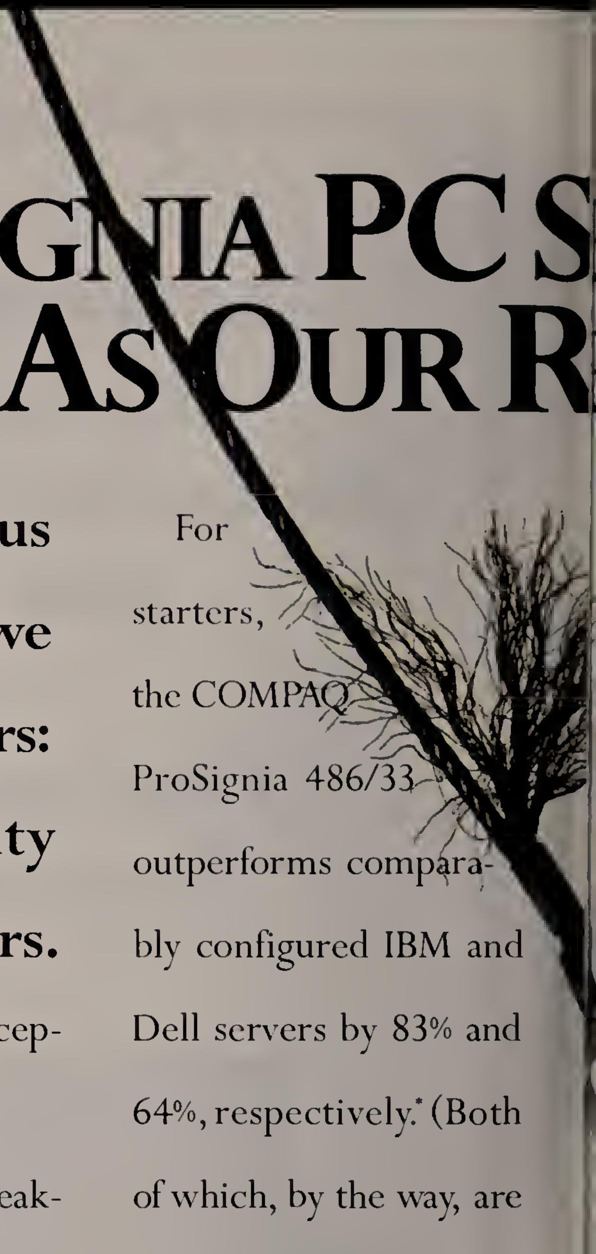

Not long ago, we introduced PCs that established us as the new leader in affordable computing. To that we now add the COMPAQ ProSignia Family of PC Servers: delivering a new level of performance, affordability and support by establishing a new class of PC servers.

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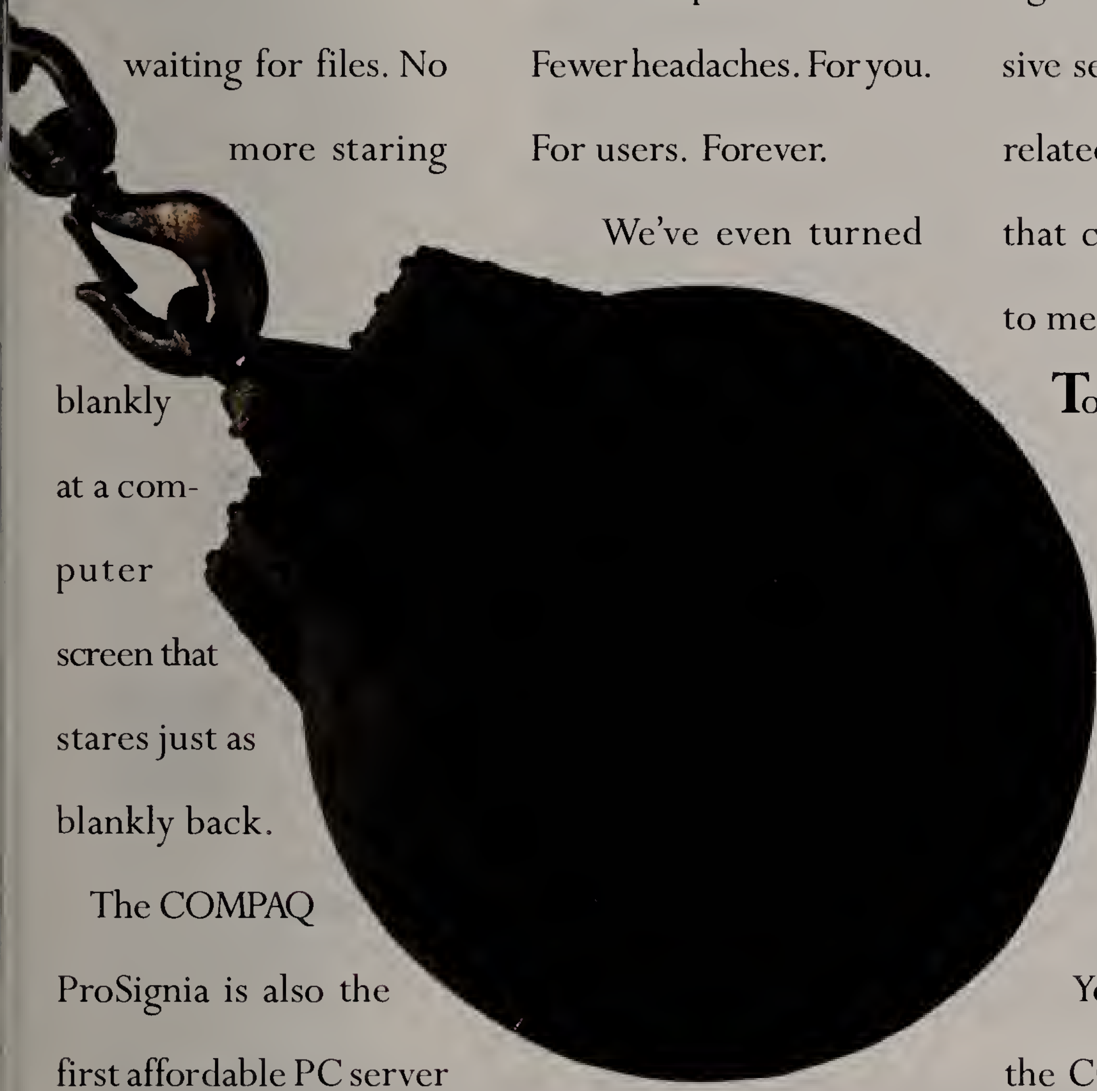

The COMPAQ ProSignia is also the first affordable PC server incorporating advanced management technologies. Included is a set of simple-to-use features that not only help you maintain better control over your entire network, but can also anticipate, and help prevent, potential problems.

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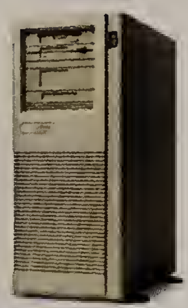

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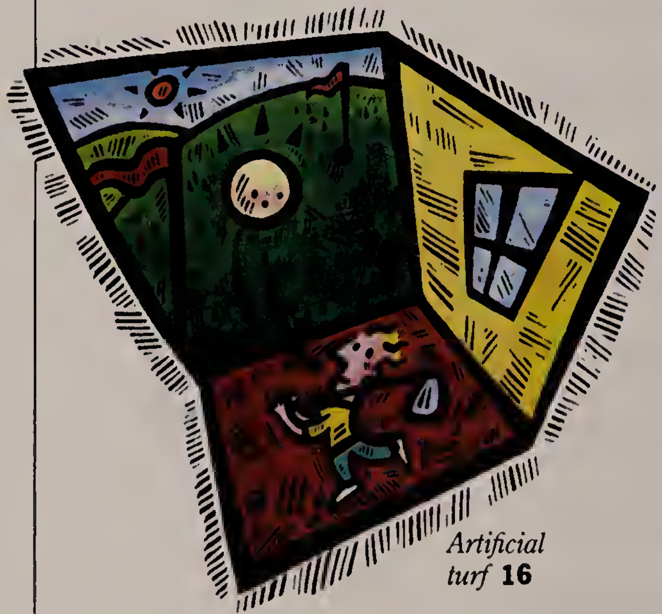

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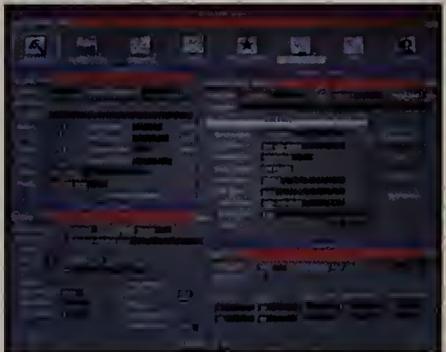

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Using pen-based computers and RAM Mobile Data's wireless networks, Conrail's yard locomotives will be able to send and receive pick-up and delivery information, as well as other messages, from its national customer service center. What used to take hours to communicate will now take a matter of seconds.

Conrail isn't alone. Countless other companies are now using RAM's wireless data networks to improve communications with field and mobile employees in order to gain a competitive edge. Field sales and service personnel and mobile professionals alike can access customer records, check pricing, place orders, initiate billing, send and receive e-mail messages and reports, all while on the go, in a matter of seconds.

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Three years ago during an informal conversation, an executive suggested that CIOs should start getting acquainted with the final consumers of the corporation's products and services. This sounded like a nifty idea, but at the time most CIOs were maxxed out planning new technology platforms and satisfying the internal customers of IS services. But times are changing. A couple of months ago, one CIO confided that calling on the company's customers was a key component of his job, but that the sales force viewed his activities as meddling.

Involvement with customers—and suppliers—is fast becoming the new underpinning of corporate America. The quality movement has been the primary driver of the customer-service revolution. And today, information executives are much more proactive in forging relationships with their companies' external constituents.

In our cover story this issue, Senior Writer Richard Pastore explores how forward-thinking information executives at Bethlehem Steel, Dannon Yogurt, DHL Worldwide Express, AT&T and Roadway Services are working with customers and suppliers on systems that intensify business ties by providing excellent customer service (please see "The Ties that Bind" on Page 42).

Tuning in to customer needs is certainly on the minds of executives. In our fourth annual survey with Coopers and Lybrand, non-IS executives were asked what advice they would give their CIOs. These top managers encouraged information executives to concentrate on becoming more responsive to customers. (Survey results will be published in January.)

In their recently published book, *The Virtual Corporation,* authors William H. Davidow and Michael S. Malone argue that "the closer a corporation gets to cost-effective instantaneous production of mass-customized goods and services, the more competitive and successful it will be.... The virtual corporation will appear almost edgeless, with permeable and continuously changing interfaces between company, supplier and customer." These are tall marching orders, calling for massive and rapid business reengineering that integrates the concept of the empowered employee and teamwork into an organization that is facilitated by sophisticated data networks.

All of this has been written and talked about for some time now in journals, academia and major consulting firms. How thorough the metamorphosis will be remains to be seen, but the movement has started.

Marcia Blumenthal

PHOTO BY WEBB CHAPPELL

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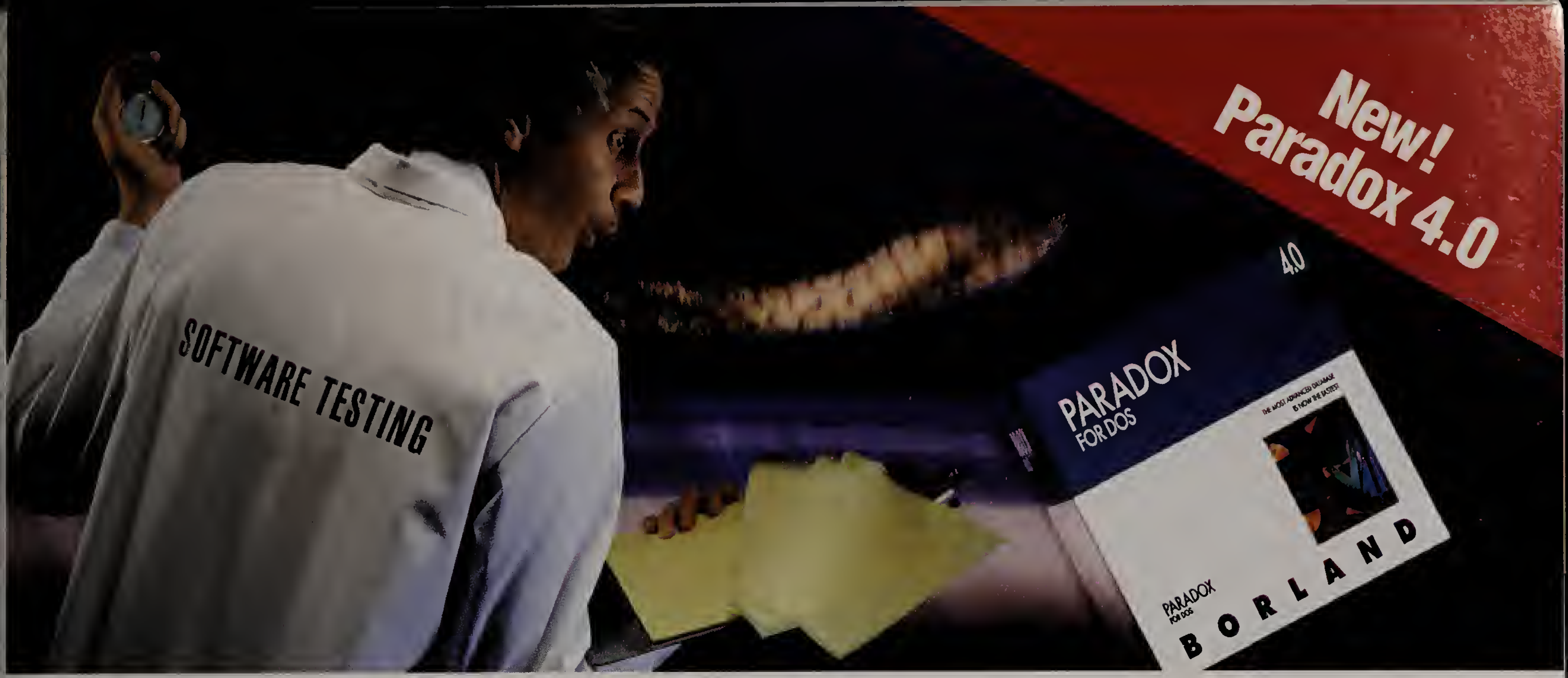

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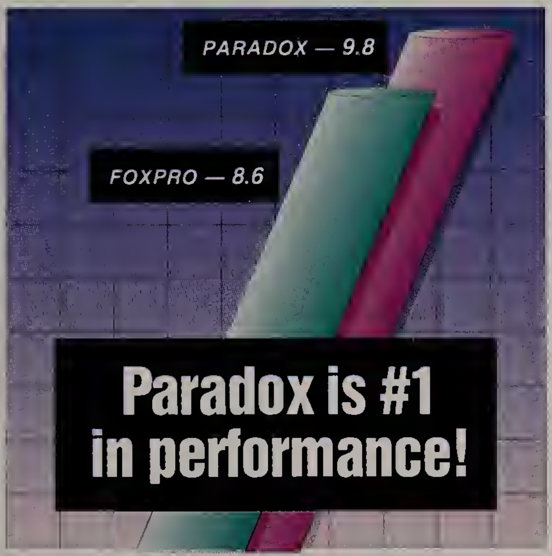

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Software Digest Rating Report, Multiuser Database Programs, May 1992, Vol. 9, No. 2. BI 1573

PHOTO BY GEORGE SIMIAN

As reported in this issue of *CIO*, more and more organizations are testing out client/server computing. The mainframe is often still a part of the picture, storing huge amounts of transaction data. But increasingly, networks with Unix servers and high-powered PCs are the engines that provide departments and end users with the competitive edge through local processing and speedy information access.

For those companies that have yet to test the waters, the costs associated with implementing client/server computing continue to be a key issue. And it's not just the up-front price tag of the new technologies. It's also the larger costs associated with retraining employees and hiring the right consultants to ensure a successful evolution to the client/server architecture.

While most CIOs understand the long-term benefits of client/server technologies, many are increasingly being pressured by senior management to produce a shorter-term payoff. CIOs need help—from vendors and consultants—in identifying the costs and explaining the associated benefits of client/server computing, with real-world examples to cut through the hype and back up claims.

IT companies that step up to the challenge of providing hard facts will help to ensure that client/server computing becomes a reality for many organizations—rather than just a few who are willing to take a risk.

P.S. The next CIO Perspectives conference, "IT Assets: Balancing People, Property and Performance," will be held March 7–10 at La Paloma in Tucson, Ariz. For more information, please call our toll-free hot line at 800 366-0246.

Coming In CIO

. . . .

People Who Need People

Despite the grim outlook of a shrinking economy, IS professionals with the right skill sets remain in considerable demand. Without active intervention in staff recruitment and development, IS chiefs will find their departments struggling to meet corporate needs when the economy finally picks up. To make matters worse, 23 percent fewer job seekers will be graduated in 2000 than in 1990, while the demand for systems analysts and programmers will grow by 76 and 70 percent, respectively. Those figures presage a human-resource planner's nightmare.

. . . .

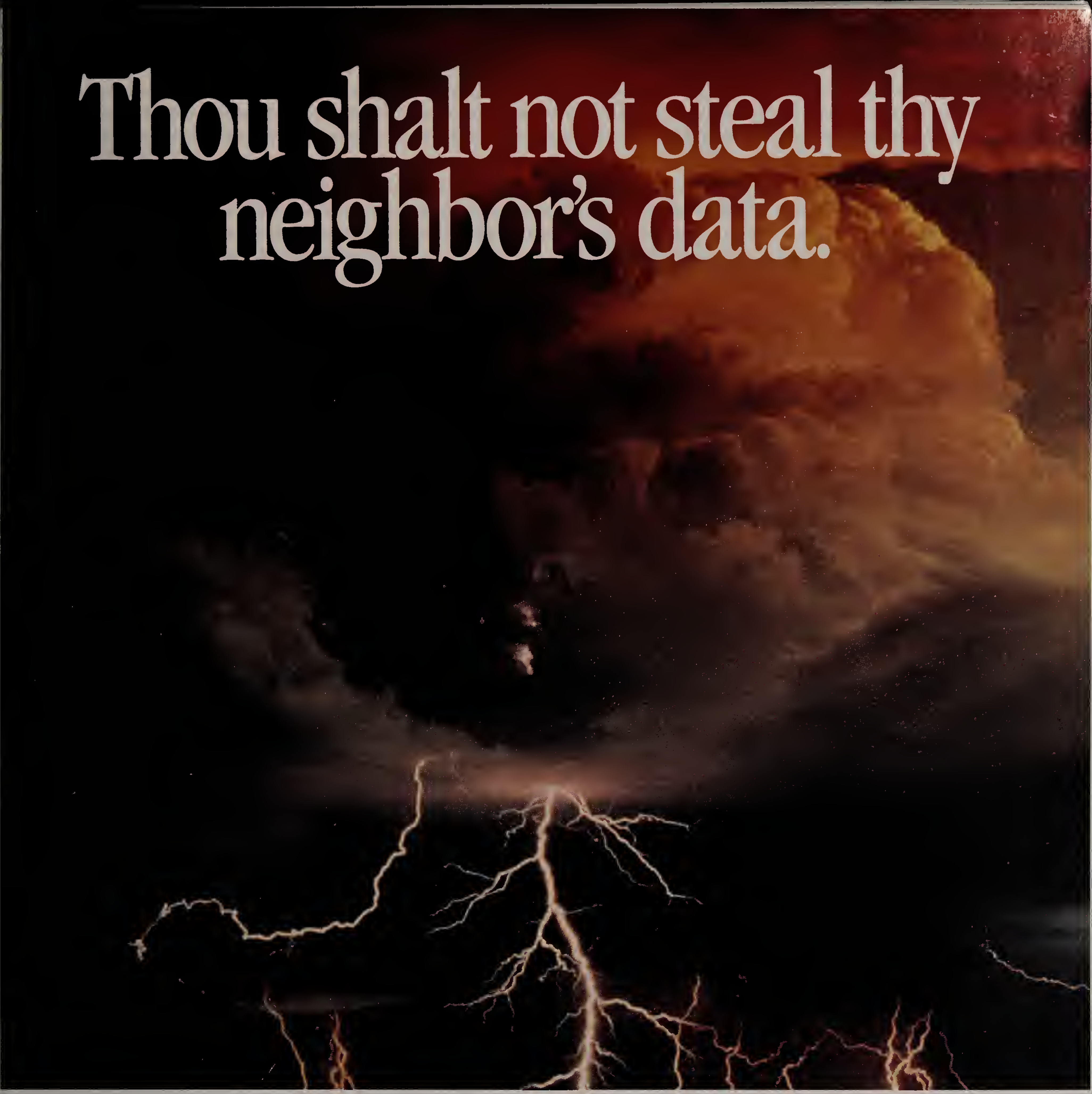
(Some) Power To the People

As the barriers that once segregated IS from the rest of the organization come tumbling down, CIOs are having to figure out how to make sure users play a strong role in IS efforts without abdicating responsibility for keeping the function cost-effective and in line with corporate strategy.

. . . .

Pen Points

Since 1989, rudimentary pen computers have been replacing pen and paper as data-collection tools. Now a second generation of these systems is making its debut. Are pen systems ready to move into general business use?



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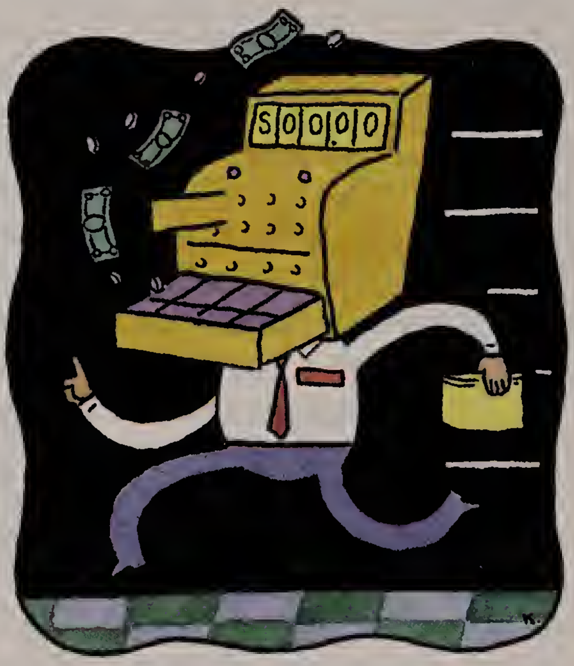
TRENDLINES

WIRELESS RETAILING

1,000 Points of Sale

Anyone who has ever waited to buy a suit during a mammoth sale knows from the permanent hanger marks on his or her hand that department stores are better at gathering lots of information about their customers than at getting them through the checkout line quickly. Now wireless point-of-sale technology offers department stores the opportunity to improve their nimbleness and service by bringing the cashiers out to the customers.



Some retailers, for example, are using a handheld wireless sales terminal, about the size and shape of a clipboard, which processes charge-card transactions anywhere in the store. The terminal can record transactions, verify credit and print receipts. At Mervyn's, a department-store chain based in Hayward, Calif., store managers wheel out a portable point-of-sale terminal to any area where business is heavy. Although the register plugs into an electrical outlet, it uses radio waves to transmit information and thus requires no cabling.

Beyond speeding up customer service, such technology is an improvement over handheld sales devices of the past—known as batch terminals—because it requires no physical connection to a larger computer in order to receive or update information, and no downtime between transactions in which to transmit. The terminals communicate in real time with a back office or remote facility via radio waves, enabling users to update inventory and sales records by the minute.

While customer-service applications are an emerging frontier for wireless sales terminals, more primitive wireless technology has been used extensively in retail warehouses and stockrooms for years by companies like K mart. Ten years ago such obstacles as limited batteries, tiny display screens and interference from airports, limousines and mobile-communications systems kept such systems from making their mark in the business world. Now that all those obstacles have been overcome, wireless sales terminals are rapidly becoming a fast-moving enabler of improved customer service. ■

Getting Your Lawyer's Number

For those torts fans who can't tell the players apart without a number, your favorite litigators may soon be sporting handy identifying tags. Martindale-Hubbell, publisher of a well-known lawyers' directory, has inked a pact with the American Bar Association to establish a lawyer-numbering scheme whereby all "domestic lawyers" (sit, come, stay?) will be assigned a unique reference number for use in their professional careers. According to Martindale-Hubbell President Ira Siegel, the numbers will help MH and the ABA "track trends in the legal profession and be responsive to the information needs of members of the legal community." ■

Button Your Software

You can throw away your dongles if a Dallas-based speciality chip maker has its way. Sure, dongles—those square-shaped hardware devices that plug into PC ports and foil software pirates—can be useful. Software applications designed for, and packaged with, dongles can be loaded into any computer, ad infinitum, but the application will not run unless the dongle is plugged into the machine. (Typically, when a dongle-proofed application starts up, it looks for the presence of the weirdly named device and shuts down like a striking Teamster if one isn't found.)

But end users aren't fond of the clunky devices, and dongles can add $15-$20 to the software's sticker price. As an alternative, Dallas Semiconductor offers a family of small, inexpensive hardware devices, called Button Ware, that could eventually make dongles extinct.

The device, a secure microchip encased in a 16mm button-shaped steel can, sells for as little as $2.10. Currently buttons must be plugged into a dongle (the company prefers to call them "button holders"), but that is fast changing: Dallas Semiconductor claims that several notebook and palm computer makers (including Psion and Videx) are designing machines that will accept the buttons directly.

The low cost will enable software makers to ship leased or trial packages of new software containing buttons that will "turn off" in 30 or 60 days. End users could also use buttons—like passkeys—to restrict access to sensitive applications. ■

ILLUSTRATION BY JAMES KACZMAN, PHOTOS COURTESY OF DALLAS SEMICONDUCTOR

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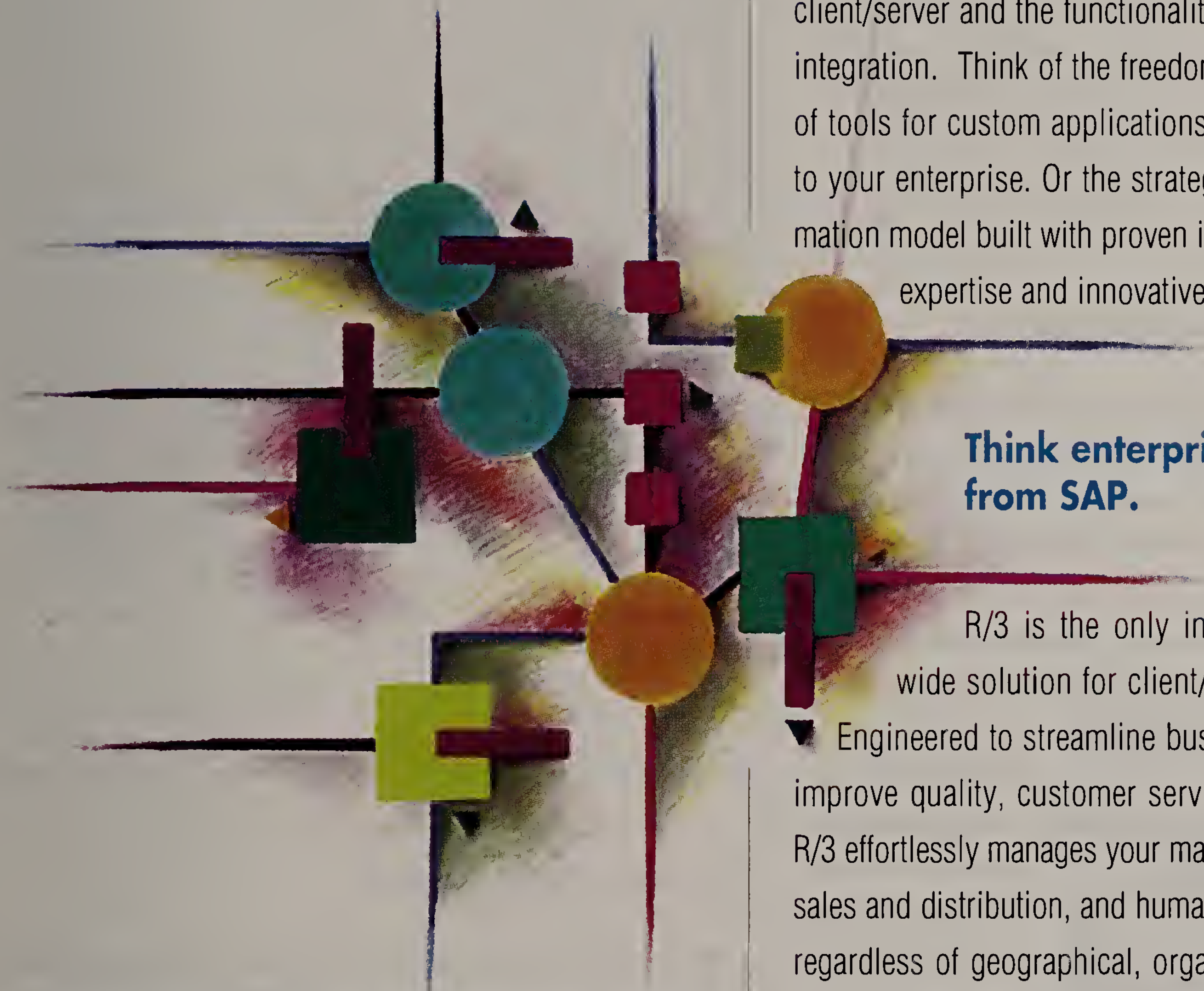

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TRENDLINES

INVENTORY MANAGEMENT

IMPROVING THE MOVING EXPERIENCE

Analysts estimate that $350 billion worth of inventory moves through the consumer packaged-goods (CPG) distribution pipeline every year. While CPG retailers and distributors rely heavily on purchasing and inventory-management systems, they use them primarily for stock reordering, not logistics management. As a result, about $200 billion of that inventory sits in warehouses and distribution centers, gathering dust instead of revenue.

Nabisco Foods and the Kellogg Company are attempting to remedy that situation through a recently announced partnership with Information Resources Inc., a provider of data to the CPG industry. The companies are charter members of a logistics information network consortium that plans to create the first integrated Distributed Resource Planning (DRP) standard for the CPG industry.

The Chicago-based company, LogiCNet, will offer members an opportunity to monitor the inventory and distribution pipeline and gain control of the flow of raw materials and finished goods. "We can help our partners save the industry billions of dollars by increasing product velocity from factory to point of sale," said LogiCNet CEO Andre Martin.

The network will have two technology components: DRP, a network-scheduling tool that tracks all movement in the distribution pipeline, from manufacturer to retailer; and a common database to which retailers, wholesalers and distributors will send their schedules, requirements, and future order projections.

Through the network, manufacturers will access DRP schedules and synchronize production with their customers' requirements. They will use EDI to send confirmations of orders and delivery commitments. Members will be able to monitor the inventory pipeline daily, while keeping track of demand by store, by customer, by region or nationally. The network will also have decision-support capabilities to help determine the impact of demand on capacity in transportation, warehousing and manufacturing.

For retailers, wholesalers and distributors, LogiCNet will improve efficiency and could result in a 30 percent drop in inventory, transportation and warehousing costs. Manufacturers will be able to monitor retail sales daily, significantly reducing their dependency on sales forecasting and improving their ability to respond to changes and problems in the distribution pipeline. LociCNet estimates that manufacturers will see cost reductions as high as 11 percent of their sales. ■

QUOTH THE SOFTWARE EVERMORE

"One must be a wise reader to quote wisely and well," wrote Amos Bronson Alcott back in 1877. Nowadays, all you need is the right software.

Writers and speakers who dream of having Oscar Wilde at their desktop but couldn't afford the grocery bills should love Quotemaster Plus, a literary-quotation retrieval package that searches combinations of characters or words for the appropriate pithy comment. The product also includes a hierarchical system that works much like a thesaurus. For example, the broad topic *business* would produce a secondary subject, *corporations*, which could lead to a tertiary subject, *profits*, which might lead to E.B. White's observation that "the trouble with the profit system has always been that it was highly unprofitable to most people." The product also includes a Favorite Quote Library that stores 12 of the user's best-loved witticisms.

Quotemaster Plus, from PennComp Software Development of Houston, is available for DOS, Macintosh and Windows. The base system containing 3,000 quotations costs $89. Additional "Quotepacks," on subjects such as humor and politics, are $60 each. But potential buyers should think carefully before making the investment. After all, as Francis George Fowler pointed out "pretentious quotations [are] the surest road to tedium." ■

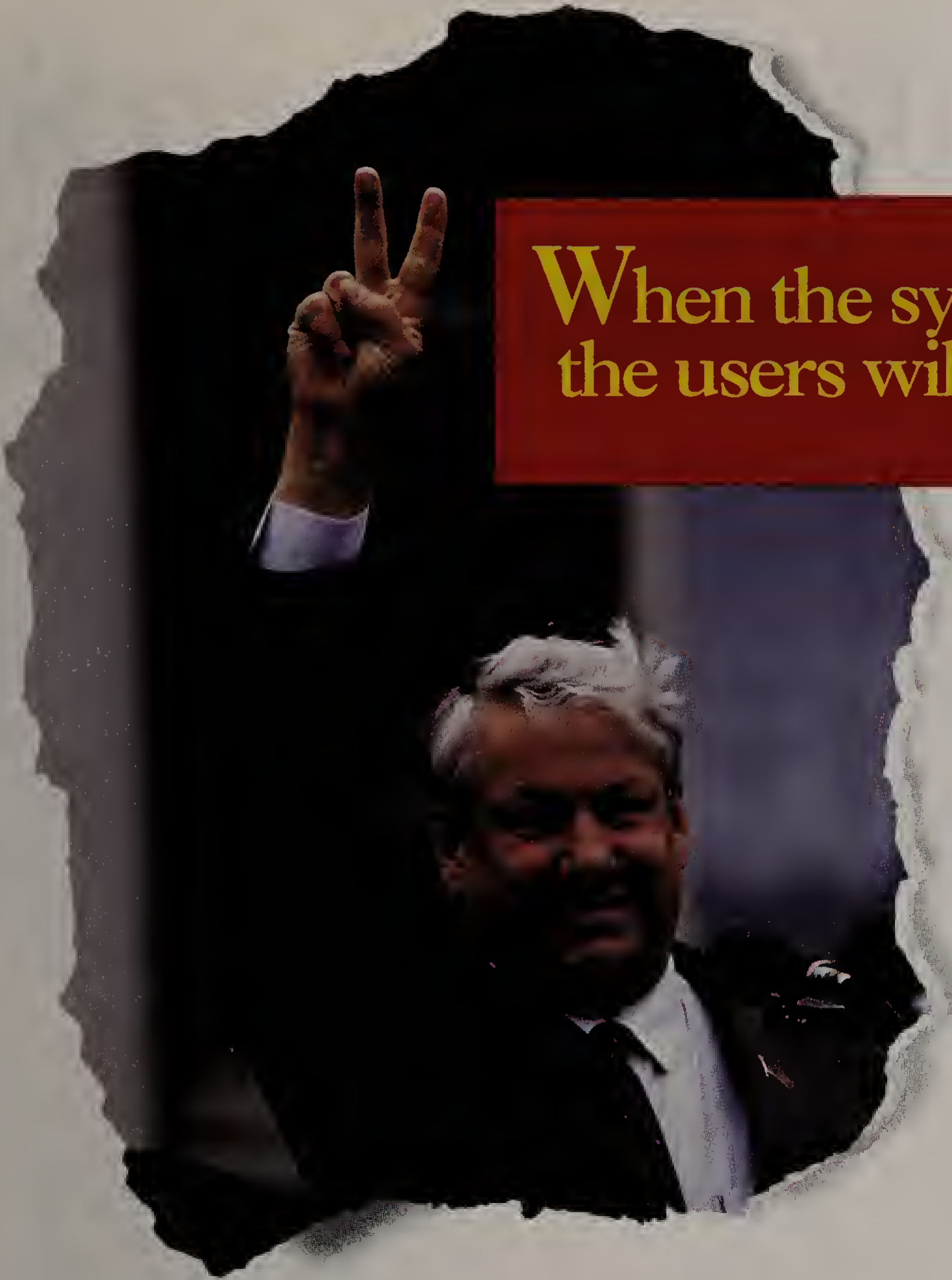
THE BIG BLUE RIBBON

IBM is perceived as doing the best job providing downsizing solutions, while Digital Equipment Corp. and Hewlett-Packard are in a dead heat for second place in the hearts of IS managers, according to a recent survey by Business Research Group of Newton, Mass. Forty percent of the 100 IS managers polled named IBM as their top choice, while DEC and HP each earned the allegiance of 19 percent.

Of those surveyed, 45 percent said they were "actively" moving toward PC-based environments, and another 42 percent said they were moving "slowly" in that direction.

Asked to distinguish between downsizing and reengineering, most respondents said that at their organizations the former means moving data off the host and reducing the number of employees. They consider reengineering more as a fundamental rethinking and redesign of business processes to achieve better performance or quality. Thirty percent of respondents said their firms have formal policies to reengineer core processes, and 65 percent reported that at their companies IS plays a major role in engineering, planning and design. ■

ILLUSTRATION BY JAMES KACZMAN



When the system fails to deliver value, the users will change the system.

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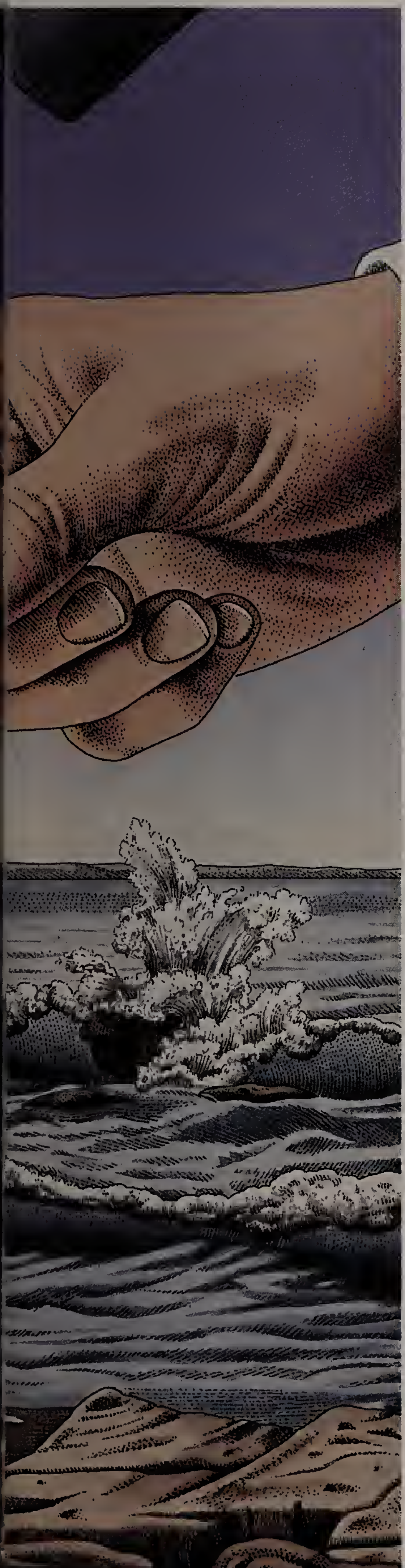

Putting Isolated Data Together Gives You Better Access To A Bigger Pool Of Information.

In most enterprises, data tends to collect in small, isolated pools, usually in a workgroup organized around a small server. Unfortunately for the enterprise, much of this mission-critical information is not easily accessed by others in the organization who have need for it.

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*Published by the Transaction Processing Performance Council, Benchmark A, April, 1992. The test was performed with UNIX SVR4 MP-RAS and INFORMIX On-Line 5.0 on a four processor system, and was audited by the independent consulting firm of Codd and Date, Inc. NCR is the name and mark of NCR Corporation. COOPERATION is a registered trademark of NCR Corporation. UNIX is a registered trademark of UNIX System Laboratories, Inc. © 1992 NCR Corporation.

TRENDLINES

SALES SUPPORT

PUTTING IT ALL TOGETHER

You're down in the family room setting up your new supercomputer when you discover that the manufacturer has thoughtlessly omitted a crucial bank of processors and 200 miles of wiring. Before you can calculate so much as a square root or the velocity of a sneeze, you need that missing stuff... Damn!

You've just fallen prey to "configuration error." Besides squandering the good will of customers, such errors cost manufacturers—especially those that make complex and widely variable or customizable products—millions of dollars annually in make-good measures, along with the overhead of maintaining an extensive error-correction infrastructure.

Because the bulk of these mistakes originate in the sales-order document, any tool that foolproofs the order-creation process could be a bonanza. So hopes Trilogy Development Group, of Palo Alto, Calif., whose SalesBuilder software addresses the configuration problem from the sales call to a company's post-delivery relationship with its presumably satisfied customer.

In an age of increasingly complex products, salespeople must master a dizzying mass of often highly technical detail about products and pricing. It's no wonder they sometimes generate an order for a system that includes pieces that will not play properly together or that necessitates a component that is overlooked.

SalesBuilder relieves the salesperson of this burden by translating a customer's requirements into a valid system spec with all necessary parts and no incompatibilities. It also features a product database for current pricing and marketing information, allowing the salesperson to quickly generate accurate quotes. The database enables salespeople to conduct what-if exercises with prospective customers by varying the configuration to achieve different price/performance objectives.

Once a configuration is agreed upon, SalesBuilder generates a price quote. When accepted, the quote becomes a sales order, which can be integrated with the company's customer-billing and -service systems.

Trilogy recently signed a software-licensing agreement with Hewlett-Packard, whose sales force will use SalesBuilder to configure HP's diverse product line. Although high-tech companies account for most of Trilogy's business, CEO Joe Liemandt says SalesBuilder lends itself to any industry with diverse and complex product offerings.

So, you're thinking of buying that new nuclear power plant... ■

"YOU'RE FIRED!" (SEND, DELETE, OPTIONS)

Sure E-mail makes it easier to schedule meetings, and yes, it reduces telephone tag. It may even increase employee productivity and motivation by enabling teamwork and telecommuting and providing a more effective means to distribute company information.

But let's be honest, it's also a great medium for plenty of non-vital communication, like gossip about coworkers, announcements of property for sale and snide commentary on the political situation. And the proliferation of electronic junk mail may not be the worst of it; E-mail may also encourage managers to avoid important (though often uncomfortable) face-to-face communication with their direct reports and other business units.

An article in the August 1992 issue of *Managing End-User Computing*, a newsletter edited by consultant Naomi Karten of Randolph, Mass., discusses the pros and cons of E-mail. The authors' preliminary conclusions, based on ongoing research, are that while the benefits of E-mail definitely outweigh the drawbacks, companies must establish user guidelines and provide training to "reduce the dysfunctional uses of the technology."

Personally, we think that a little lighthearted E-mail banter can be a good thing. It probably even cuts down on time spent hanging around at the coffee machine. But it would be disconcerting to get your next performance review from the computer screen. ■

NEW VENTURES

Leading voice-messaging manufacturers and service providers have formed an industry group to promote understanding and use of the systems. Founding members of The Voice Messaging Educational Committee (VMEC) include AT&T, Centigram Communications Corp., Digital Sound Corp., Northern Telecom Inc., NYNEX, Octel Communications Corp., ROLM, Tigon Voice Messaging and VMX Inc.

VMEC will attempt to develop guidelines for voice-messaging management and use and telephone-answering tips. The group will also provide implementation and training programs and highlight successful voice-messaging applications. VMEC invites participation from other voice-messeaging manufacturers, suppliers and service providers.

Network Management Inc. (NMI), a systems-integration company, will join Sun Microsystems Computer Corp. in Sun's Commercial Systems Integrator Program. Under the agreement, NMI will provide companies that have made the transition to Sun computer workstations and products with systems-integration services, including requirements analysis, network design and implementation, application-development support and facilities-management services.

NMI is based in Fairfax, Va.; Sun Microsystems is based in Mountain View, Calif. ■

ILLUSTRATION BY FRAN O'NEILL

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Enter Sprint's Time of Day Routing. Your West Coast office picks up the slack when your East Coast office goes home at night. And your East Coast office begins the day. While your West Coast office is still in bed.

No missing calls. No unnecessary overtime.

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With Sprint's Dealer Locator, you no longer have a lot of different 800 numbers in a lot of different states. Your customers call just one 800 number. Enter their zip code. And the calls are routed to the dealer closest to them.

Yes. All those dealers. And one 800 number.

- What about your worst nightmare? Your 800 number goes down. Thanks to Sprint's pre-planned, pre-stored Command Routing, you'll be up and running in minutes.

Sprint. 800 service. Unlimited solutions.
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TRENDLINES

EVENTS

The 19th Annual Computer Security Conference
Chicago Hilton and Towers, Chicago
November 16-18
Computer Security Institute
415 905-2626

This conference focuses on the role of computer, telecommunications and information security as a critical, value-added function. Attendees can choose 10 sessions from more than 120 and visit over 100 vendor exhibits. Registration fees: $595-$945.

A Framework For Development: Building the Information-Based Enterprise
Infomart, Dallas
November 17-18
Information Engineering Systems Corporation
703 739-2242

This conference is designed for senior business managers and IS professionals. The first day focuses on how organizations can direct and manage change to achieve competitive advantage. The second day deals with critical system-development issues, including distinguishing among different methodologies and creating reusable software programs. Registration fee: $995.

COMDEX/Fall '92
Sands Expo and Convention Center, Las Vegas
November 16-20
The Interface Group
617 449-6600

Attendees can visit showcases dedicated to network computing, multimedia, imaging and OEM business. The show floor will feature displays of computing hardware, software, peripherals and accessories. Leading industry executives will discuss issues and directions that will drive desktop computing throughout the 1990s. Registration fees: $195-$450.

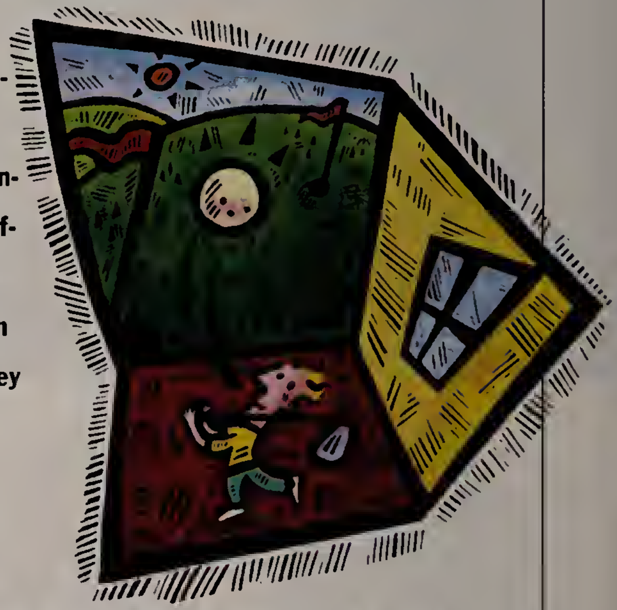
Wireless Datacomm Exposition & Conference
Marriott Copley Place, Boston
December 7-9
BCR Enterprises Inc.
203 847-5131

Three conference tracks cover business applications, government regulations and technology-development issues. Included are a wide range of wireless computing and communications products and services which have applications for the business end user as well as specific vertical industry functions. Registration fees: $295-$1,095.

MICROCHIP SHOTS

For some strange reason, a remarkable number of people haven't yet learned to despise golf. For these legions of the misguided, computer technology offers a couple more ways to take their shameless pleasure.

Friendly Software Inc., of Whitehouse, Ohio, has "Ultimate Challenge Golf," a simulation game in which players hone their "course-management" skills (such as selecting the right club for the lie of the ball and the degree of risk in the shot). Players choose between two "championship" courses and can manipulate distance, lie, player characteristics, equipment, weather and course conditions. Shots and variables play out faithfully to what a player would experience on a real course. To quote from the literature: "Ground types include fairway, three levels of rough, heather, three types of sand, playable water and pine needles." The game retails for $59.95. Fore!



For more physically interactive sport, Full Swing Golf (Poway, Calif.) and Wintriss Engineering Corp. (San Diego) offer a $42,000 10-by-12-foot Astro Turf-lined room in which you can play 18 holes of Torrey Pines without a membership.

Using their own clubs, golfers drive (or putt) a standard ball toward a canvas screen displaying computer-generated full-color scenes of the course. ("Bird or wind sounds are available on command.") Once the ball hits the screen, a simulation program calculates and displays its path into the scene.

Simulators are popular in cold climes where winter golf is impossible. The makers also report inquiries from Japan, where club memberships are astronomically costly. ■

CLOSING THE OPEN WINDOW

If you think that open systems are going to put money in your pocket, you had better think again. So concludes a recent research report by CSC Index of Cambridge, Mass.

According to the report, "Implementing Open Systems," the window of money-saving opportunities previously found by moving to open systems is closing. Said co-author Roger Hart, "As proprietary systems become more and more open, they must compete with open system pricing, thereby reducing the cost advantage once enjoyed by open systems."

All is not lost however. As the savings potential diminishes, the real payoff of open systems will be interoperability that goes far beyond the idea of interconnection.

"With interoperability increasingly feasible on open platforms, organizations will be able to build truly multivendor, distributed computing environments," Hart said. "This will enable them to better support business processes across multiple divisions and sites."

In addition to interoperability, which the report predicts will be universally feasible by 1996, open systems will pay off in terms of portability of applications, data and people.

The report also addresses open systems tools and techniques, difficult implementation issues, standards and migration options.

The report was based on interviews with 44 international users and suppliers and an analysis of more than 50 cases. ■

ILLUSTRATION BY FRAN O'NEILL

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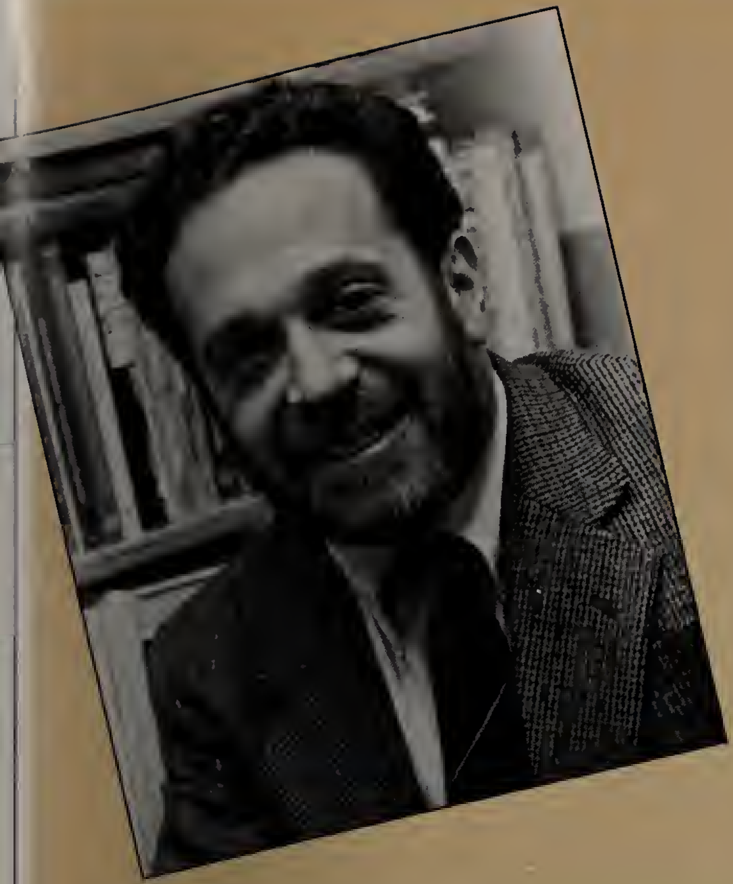

In "...the coming century there will be no national products or technologies, no national corporations, no national economies... Each nation's primary asset will be its citizens' skills and insights; information–and how it is leveraged–will become the critical success factor for business survival in the new global economic web."

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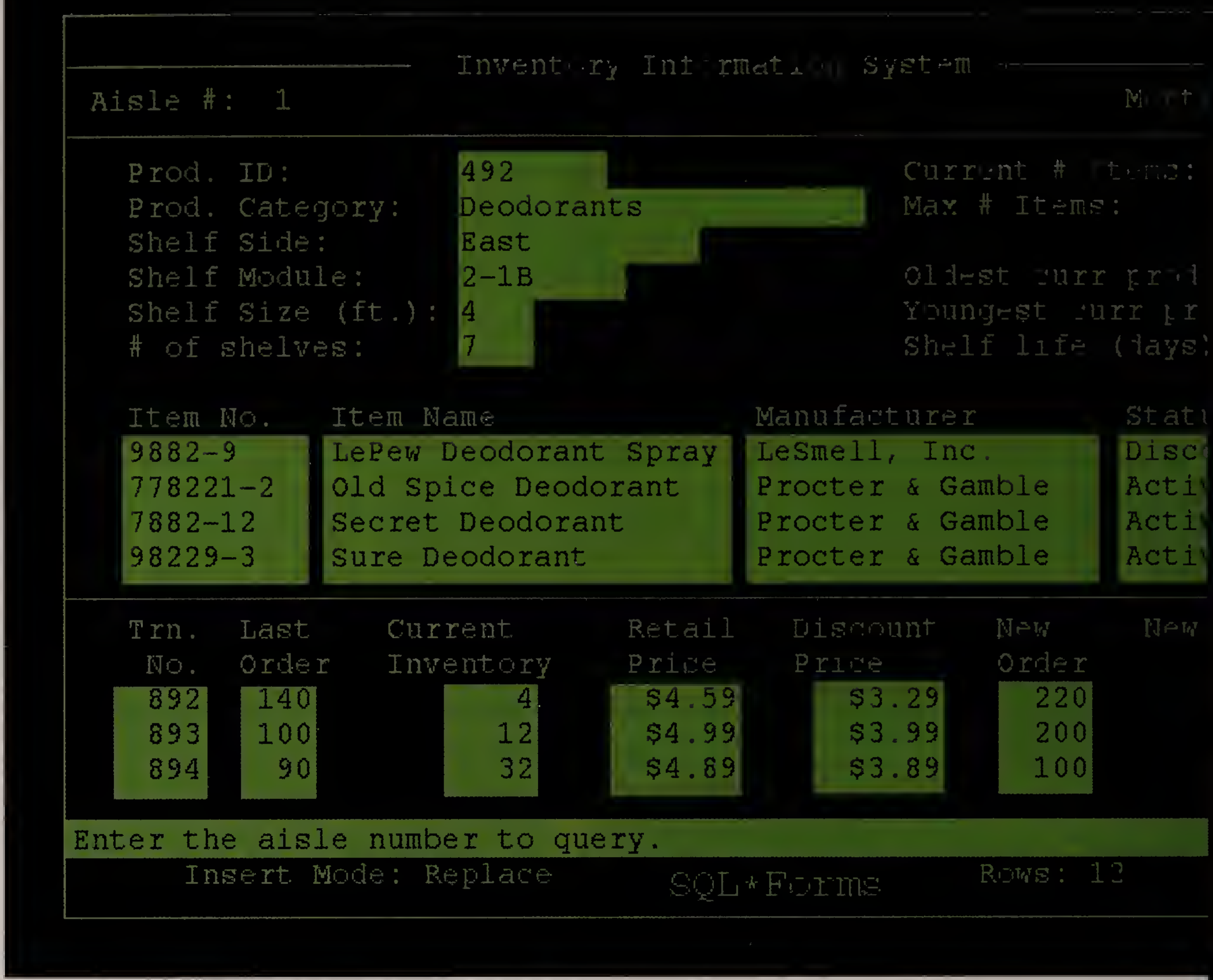

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                     Inventory Information System
 Aisle #:  1                                                      M

   Prod. ID:              492                       Current # Items:
   Prod. Category:        Deodorants                Max # Items:
   Shelf Side:            East
   Shelf Module:          2-1B                      Oldest curr prod
   Shelf Size (ft.):      4                         Youngest curr pr
   # of shelves:          7                         Shelf life (days)

   Item No.    Item Name                Manufacturer           Stat
   9882-9      LePew Deodorant Spray    LeSmell, Inc.          Disc
   778221-2    Old Spice Deodorant      Procter & Gamble       Acti
   7882-12     Secret Deodorant         Procter & Gamble       Acti
   98229-3     Sure Deodorant           Procter & Gamble       Acti

   Trn.   Last    Current      Retail    Discount    New       New
    No.   Order   Inventory    Price     Price       Order
    892    140            4    $4.59       $3.29       220
    893    100           12    $4.99       $3.99       200
    894     90           32    $4.89       $3.89       100
Enter the aisle number to query.
      Insert Mode: Replace         SQL*Forms         Rows: 12
```

Screens exhibiting similar data show the difference between traditional applications (above) and real world applications developed using Sybase's Gain (right).

THE OBJECT IS

After all the hardware, all the software, all the megabytes and ROM and MHz, it finally comes down to a person sitting in front of a computer screen, trying to be productive. To see relationships. To make connections. To draw conclusions.

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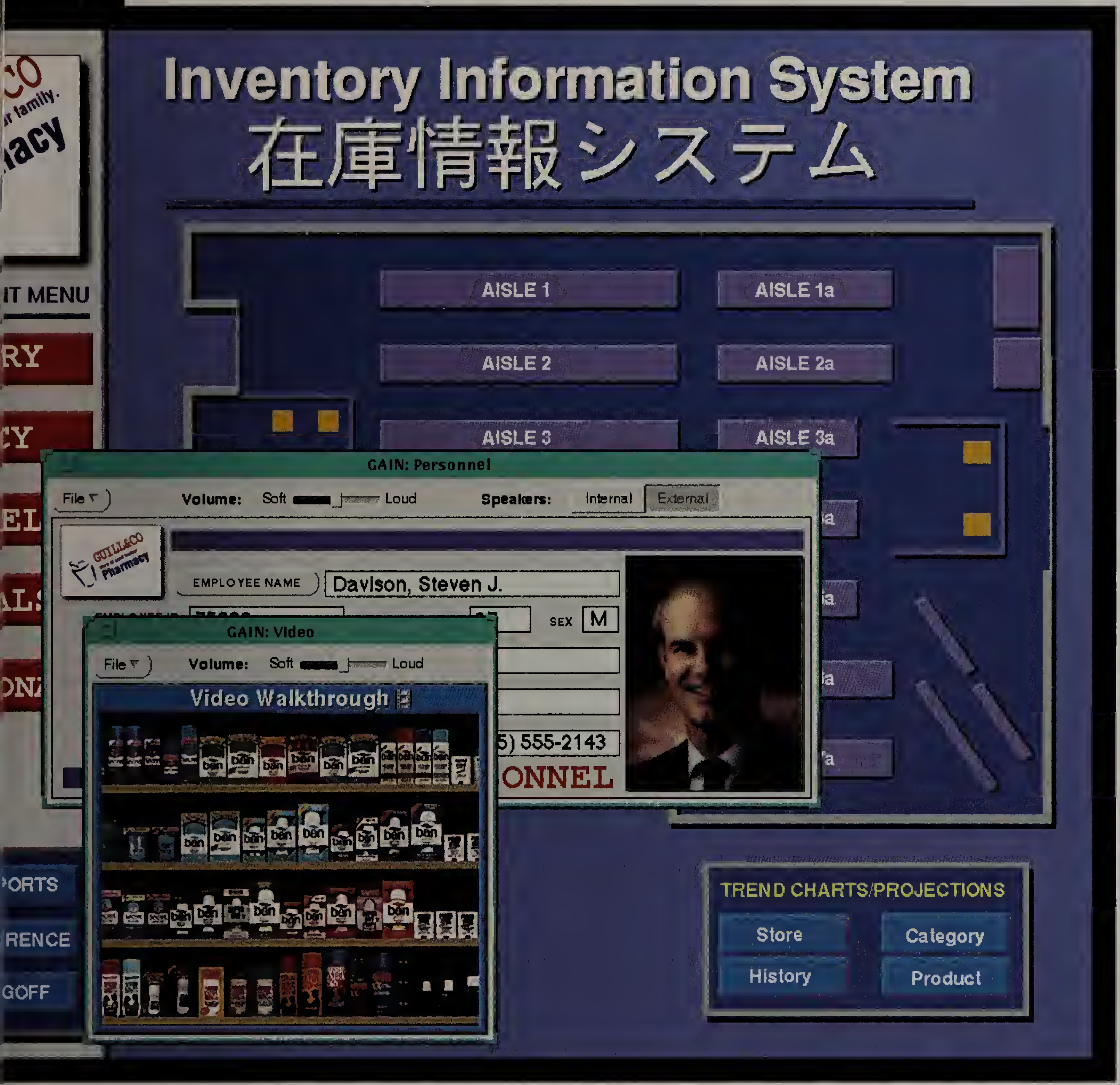

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The Quality Quagmire

Too often, quality movements get bogged down in endless, unprofitable activities. But by insisting on immediate gains, companies can achieve significant improvements now and for the long term.

BY ROBERT H. SCHAFFER

In response to an unrelenting media drum beat, companies are jumping aboard the "total quality" bandwagon in droves. Unfortunately, most of these companies will waste vast amounts of time, energy and resources by accepting, on faith, the fatally flawed assumption that drives the quality movement: that quality activities must inevitably yield quality results.

Thus companies invest huge sums in training programs, employee-involvement programs, benchmarking programs, quality-planning programs, win-the-Baldrige-award programs and dozens of other activities. Yet recent surveys by Arthur D. Little, the American Electronics Association, McKinsey & Co. and A.T. Kearney reveal that only about one-third of the companies with total quality programs have achieved significant results. Observations by my own firm indicate that the situation may actually be even more bleak.

IS groups can be victimized by these TQM failures in two ways:

First, many companies feel that better information is essential to any major quality thrust; thus busy IS groups find themselves pressed into service to gather more data and prepare more reports.

Second, in addition to supporting the programs of other functions, IS itself may be required to launch myriad quality activities while other work is delayed.

If these investments contributed to real customer service and other performance gains, the extra effort would be justified. But as survey after survey of TQM programs reveal, too often the investments are made but the results fail to materialize. The reasons for these failures are not hard to understand.

Too large and diffused: Most companies launch dozens of activities all at once and in multiple locations. One large corporation whose quality effort is frequently cited as a model had to make a "fish-bone" diagram simply to list its nearly 50 different quality activities. When improvements occurred in that corporation, how could its managers possibly tell whether any of these programs contributed—or whether other efforts were responsible?

Confusion of means and ends: Because of the assumption that quality activities will always yield quality results, many total quality programs focus exclusively on activities. One large corporation, for example, launched its total quality effort with a massive training program for all managers and employees. Tracking processes were established so the company could report how many people had been trained and how many were using various problem-solving and employee "empowerment" processes. Virtually 100 percent of the program's energy was concentrated on such activities. Even though terms like "results," "competitiveness" and

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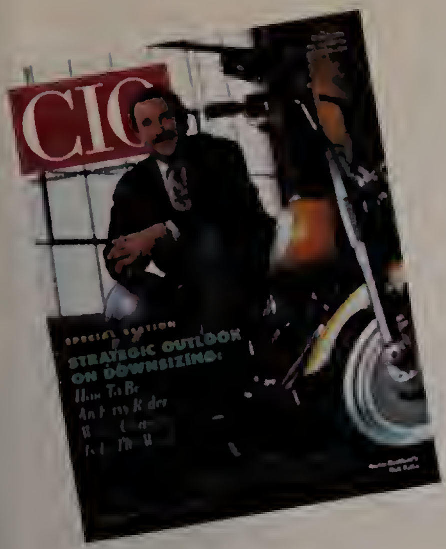

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"customer service" were sprinkled throughout the company's newsletters and training materials, no specific steps to achieve measurable quality results were actually undertaken. And few results materialized.

Adrift in time: Total quality programs rarely spell out step-by-step milestones or beginnings and ends. Instead, quality gurus tell management that the transformation to a "total quality culture" is a long-term process. In other words: "Start investing in quality activities. Invest plenty if you want to be viewed as really committed. And don't complain if there are no results. It probably means you and your people are not exerting enough effort."

One company proudly published its TQM schedule: "Year 1: Start-up. Year 2: Year of Awareness and Understanding. Year 3: Year of Transition and Transformation. Year 4: Year of Significant Results." Faith in a waiting pot of gold seduces otherwise sober managers to abandon their insistence on hard evidence.

Managers let off the hook: One insidious obstacle to improved performance occurs when people who have been asked to achieve better results respond, "This is the absolute best we can do, boss." At that moment an invisible line is drawn, and few bosses manage to cross it. Managerial failure to demand better results is the Achilles heel of most performance-improvement efforts.

Instead of helping managers overcome this limitation in their management skills, total quality programs actually encourage them to avoid the problem. They are told: "Just send your people to the training sessions, set up 'empowered' teams, establish reward-and-recognition machinery and, voila! results will shower down—in three or four years."

But there is a more pragmatic approach to the quest for quality. Companies can improve their performance using an approach that starts with immediate, tangible gains that can be achieved in weeks, not years. How is it possible?

Everyone has observed what happens when a group is suddenly confronted with emergency or must-do situations: Performance improves immediately. One IS operations group, for example, produced a comprehensive business report in 24 hours instead of the usual two weeks when the CEO suddenly announced a visit. And the report had fewer errors than the two-week reports.

This "hidden reserve" of capability for better performance is present at all times. The results-driven strategy described below shows managers how to launch quality-improvement efforts by exploiting this reserve to achieve immediate gains—as opposed to taking months or years to add new skills and techniques.

Results-driven IS quality thrusts: An IS group at Union Camp, a forest products company in Wayne, N.J., began its quality process by producing

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certain tax reports in a more timely fashion. IS at General Reinsurance in Stamford, Conn., set—and met—some short-term goals to reduce backlogs and improve programming productivity. A group at insurer ITT-Hartford eliminated a troublesome maintenance backlog and increased its productivity by about 30 percent—all within six months.

In each case, service improved quickly for the customers of these systems groups, creating a better environment for continued collaboration. And the projects were designed to provide solid experience to systems managers and professionals in how to organize and carry out a quality-improvement program—skills that were then applied in an expanding effort.

Training, customer assessment and other quality measurements and tools are not forgotten in this process: All are necessary for sustained quality improvement. But rather than being the focus of the effort, they are introduced gradually, to help accomplish specific goals. For example, instead of herding the entire organization through an "introduction to quality" training package, companies make available modules of training that staff can exploit incrementally as needed.

Results-driven projects with users/clients: A systems group at General Electric was asked to help design a new inventory-control process for a major plant. Its management wanted to reduce inventories and eliminate stock-outs. During the preliminary investigation, serious anomalies were discovered in raw-materials records. A solution was recommended: The systems group drafted a letter for the plant's purchasing department to send to all vendors. The letter specified the information to be affixed to every item delivered to the plant. Thus, instead of waiting the usual six, 12 or 18 months for a payoff, this user received significant help within days.

Opportunities almost always exist to help clients achieve some results quickly. For example, IS can make a customer's current system work better while designing the new one, or help it to streamline work processes before automating them.

As IS groups design their own quality efforts to yield immediate results, they will be modeling a more effective approach to total quality. And as they learn to help users produce immediate gains while working on longer-term systems improvements, IS managers will be providing leadership in real quality performance—that is, in the company's capacity to respond quickly and effectively to customer needs.

Doesn't that beat merely going through the quality motions?

Robert H. Schaffer is a principal of the management consulting firm Robert H. Schaffer and Associates in Stamford, Conn., specializing in quality issues.

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By exploiting and combining the most effective vehicles for delivering critical business information, multimedia offers real improvements in the way information is received, analyzed and absorbed

INFORMATION ALCHEMY

Multimedia promises to jazz up tired old business applications like electronic messaging, computer-based training and document storage and retrieval with a sparkling array of new tools that integrate text and graphics with sound, still images and full-motion video. But real breakthroughs await improvements in compression technologies and network transmission capacities.

BY DENNIS LIVINGSTON

CATERPILLAR

Image Storage & Retrieval

Some companies are using the power of video to create large databases of still images. At Caterpillar Inc. in Peoria, Ill., 43,000 images of the company's products and components and people using company equipment have been stored in Image Concepts' C-Quest ESP image cataloging system. The marketing staff uses this material to produce Caterpillar advertising, dealer brochures, training literature and spec sheets.

C-Quest is based on what the vendor calls a "hierarchically structured, synonym thesaurus" filing method. Instead of memorizing keywords, users search for images on the basis of a broad or narrow set of terms. Caterpillar's version contains a 36,000-word thesaurus customized with an additional 20,000 terms, including product names, model numbers, the shoot location and machine types. Up to 18 images that match a user's search criteria can be retrieved and simultaneously displayed within 10 seconds, along with information on where the originals are filed. Specific images can be stored in a save file for later viewing.

"We estimate savings of at least $250 every time somebody uses the system to find an image they need instead of spending money to shoot the same thing," said Doc Evans, image analyst at Caterpillar. "Retrieving images this way saves substantial time compared to flipping through three-ring binders filled with contact sheets. Data-entry and -retrieval training are also a lot easier with C-Quest's filing technique."

–D. Livingston

Growing appreciation for multimedia's potential should push the business market for multimedia systems from $219 million in 1991 to $2.7 billion in 1996, according to Daratech Inc., a Cambridge, Mass., market-research firm. Industry observers, however, warn that marketing hype may overshadow what can actually be accomplished with current multimedia technology. Multimedia, like any application of technology, must be approached with an eye toward how it addresses real business problems with cost-effective solutions.

"Businesses first have to be aware of how multimedia might be relevant to their operations," said Charles Levinson, director of multimedia services at Answers Research of Solana Beach, Calif. "Then they have to develop appropriate applications. That can be expensive, especially in a tight economy." Some of the best multimedia authoring software, for instance, can cost from $5,000 to $10,000, Levinson said. "Many such programs are not yet easy enough for broad-based use, vendor support is a problem, and documentation tends to be terrible."

> *"Businesses first have to be aware of how multimedia might be relevant to their operations. Then they have to develop appropriate applications. That can be expensive, especially in a tight economy."*
>
> *–Charles Levinson*

Depending on the application, additional expenses are incurred to produce the program, particularly if video segments are involved, and to expand computing platforms with boards that digitize analog audio and video input, videodisk players, CD-ROM drives and other playback devices.

THE GREATEST barriers to fully realized multimedia are the limited capacity of CD-ROMs for storing and LANs for transmitting full-motion digital video, and the incompatibility of video-compression standards. Given those limitations, several developments promise to lower the cost and risk of preparing multimedia programs. Tandy, NCR and Zenith Data Systems are among the vendors offering PCs entitled to carry an "MPC" logo from the Multimedia PC Marketing Council, an association of PC manufacturers headquartered in Washington. Minimum requirements for an MPC computer are a Microsoft Windows 3.0 (or higher) operating system with Multimedia Extensions, '286/10 MHz (or

ILLUSTRATION BY J.W. BURKEY

faster) processor, 30MB hard disk, CD-ROM drive, VGA video adapter card and 8-bit audio board. Other platforms pre-configured with some multimedia components include IBM Corp.'s PS/2 M57 SLC, the SPARCstation 10 from Sun Microsystems and Silicon Graphics's IRIS Indigo workstation.

Microsoft and Apple have added application programming interfaces (APIs) and other elements to their operating systems that make it easier for applications to access drivers for multimedia peripherals. Microsoft's Windows Multimedia Extensions is now bundled with Windows 3.1, while Apple's QuickTime runs as an extension to the System 7 Macintosh operating system.

> *The greatest barriers to fully realized multimedia are the limited capacity of CD-ROMs for storing and LANs for transmitting full-motion digital video, and the incompatibility of video-compression standards.*

CIOS AND IS STAFF experienced in multimedia carefully tailor their systems to solve specific business problems. They also take an incremental approach to implementation. This is critical because the technology is rapidly changing, according to Marty Colletti, director of human factors and multimedia at The New England, a Boston-based national insurance and investment firm. The New England installed a simple multimedia system in its headquarters to educate teleservice employees about the company's Universal Life product. But Colletti's team had a hard time getting the program underway because of constantly evolving technology, she said. "Over the past two years, we've gone through five versions of Microsoft's Windows Multimedia Extensions and three versions of [AimTech's] IconAuthor [authoring software]. It was like developing a program in quicksand."

Training is one of the areas to which multimedia has been applied most successfully. In some cases it simply makes dry, dense material more interesting, and therefore easier to learn. For instance, The New England's Universal Life policy is 80 single-spaced pages long. The company needed a more interesting and expeditious way to provide information about the policy than the standard training course, which involved a lot of reading, what-if situations and quizzes. Trainees found it hard to concentrate on the material for any length of time using the traditional methods.

"Most of the people we're trying to reach are TV babies," said Colletti. "They expect more pizzazz than you get from reading text and looking at simple graphics on traditional computer-based training systems." Multimedia helps increase trainees' attention spans and enables individuals to take advantage of presentation styles in which they learn best, whether audio-, video-

MANNINGTON RESILIENT FLOORS

Marketing & Sales

It's hard for most people to envision from a small flooring sample how an entire surface covered in the product will look. Mannington Resilient Floors, of Salem, N.J., is using interactive kiosks to help customers understand its products and select those that best fit their needs.

Using a touch screen, users select a room to view (kitchen, bathroom, etc.). A series of photographs are displayed, and the user chooses the room that looks most like the one to be redecorated. The room can be viewed with different floor patterns, colors and product grades. Still and motion video, sound and graphics provide information about prices, installation techniques and warranties.

The Mannington kiosk, which was integrated by the Frontier Media Group of Malvern, Pa., also includes an interactive sales training program to educate new salespeople about the company's products and policies. The system presents trainees with full-motion customer scenarios and scores them according to how they respond at various decision points. Scores are used to guide additional training.

–D. Livingston

AMERICAN AIRLINES

Inventory Management

Mechanics at American Airlines' Dallas-Ft. Worth Airport overhaul hangar are using multimedia to reduce the number of tools that need to be stored locally at maintenance sites.

Each of American's 16 overhaul sites is equipped with its own tool room. American decided it would be more efficient to store specialized tools, many of which are used only once or twice a year, in a centralized automated warehouse in Tulsa, Okla., already used to fulfill spare-parts requests from mechanics. Tools could then be sent along with the relevant parts. The problem was how to help a mechanic visually identify the tools needed without visiting a tool room.

American's Sabre Computer Services, which designed the system, began by digitizing and capturing live-input video images of the 9,000 tools one frame at a time using a Targa+ image-capture board from Truevision Inc. These images are transferred to 8-millimeter videotape and stored as binary large objects (BLOBs) on an Oracle database management system at the Dallas-Ft. Worth maintenance site. A quarter-screen image takes up 60K, easily transmitted over the facility's Novell LAN to individual workstations.

Mechanics can select tools by their parts numbers or by criteria such as the aircraft being worked on and the task to be performed. The application retrieves images of tools that meet the criteria, along with parts numbers and other information, within two seconds.

American expects to save millions of dollars by shutting tool rooms at the 16 sites to which the system will eventually be deployed.

–D.Livingston

or text-based, according to Colletti.

The program combines audio, animation, still images and text in a three-hour package that covers major aspects of the policy. Individuals can pace themselves through this material. According to Colletti, the program has increased both the amount of material employees can retain and the length of time for which they can retain it.

BRINGING DIGITAL video—which enables random-access searching, flexible editing, image manipulation and network transmission—to computers remains multimedia's greatest challenge. Even a 650MB CD-ROM can only hold about 20 seconds of full-motion video. The Joint Photographic Experts Group (JPEG) specification, with 20-to-1 data-compression ratios, is suitable for still-picture compression but too slow for full-motion video. The Moving Pictures Experts Group (MPEG) format, with ratios several times that of JPEG, is not yet finalized.

The expense of video-compression hardware can be avoided with the use of software-only video-playback schemes, but quality and the size of the window that can be viewed are limited. Microsoft's Audio Video Interleaved (AVI) format enables software running under Windows to play back digital video stored using the JPEG standard. AVI technology typically permits 15 frames-per-second of motion video to run at resolutions of 160 x 120 pixels.

> *"Most of the people we're trying to reach are TV babies. They expect more pizzazz than you get from reading text and looking at simple graphics on traditional computer-based training systems."*
>
> *–Marty Colletti*

According to Microsoft, AVI is particularly suitable for interactive newsletters and books that include video sequences, but it is not appropriate when full-screen, full-motion video is required. IBM, Sun and Fluent Inc. are among other companies developing or introducing software-only solutions.

Live video, which is not constrained by storage requirements, is currently

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being used in videoconferencing, medical imaging, animation sequence generation and manufacturing inspection. For instance, Topcon Technologies Inc. of Pleasonton, Calif., has developed a wafer-inspection system it markets to semiconductor manufacturers that uses live video to speed the inspection process. The system uses scanning electron microscopes (SEMs), capable of resolutions to the atomic level, to view and analyze the images in real time on a Sun window or store them for later comparison to chip layout information carried in the system's database.

"Without live video, the SEM signal would have to be sent over a network to an external digitizer and back to the workstation," said Mike Chang, Topcon's engineering manager. "That could take one or two seconds." With some wafers requiring hundreds of such inspections, conventional methods "cause unacceptable delays in the rate at which wafers pass through a production line," Chang explained.

MULTIMEDIA MARKET DATA

Several recent market reports provide additional information about multimedia users, vendors and applications.

COMPANY & LOCATION	REPORT TITLE & PRICE
Answers Research Solana Beach, Calif. 619 792-4660	Multimedia 1992 Buyers Guide, $495
Daratech Inc. Cambridge, Mass. 617 354-2339	Multimedia Defined, $1,495
Grassroots Research San Francisco 415 954-5493	Year of Opportunity: 5 Market Segments of Multimedia, $3,900
The Insights Research Corp. Livingston, N.J. 201 605-1400	Multimedia Computing & the Network: Applications & Telecommunications 1992-1997, $3,000

> *"You have to be practical about what you can do. Nobody will use a system that keeps crashing because it's ahead of its time."*

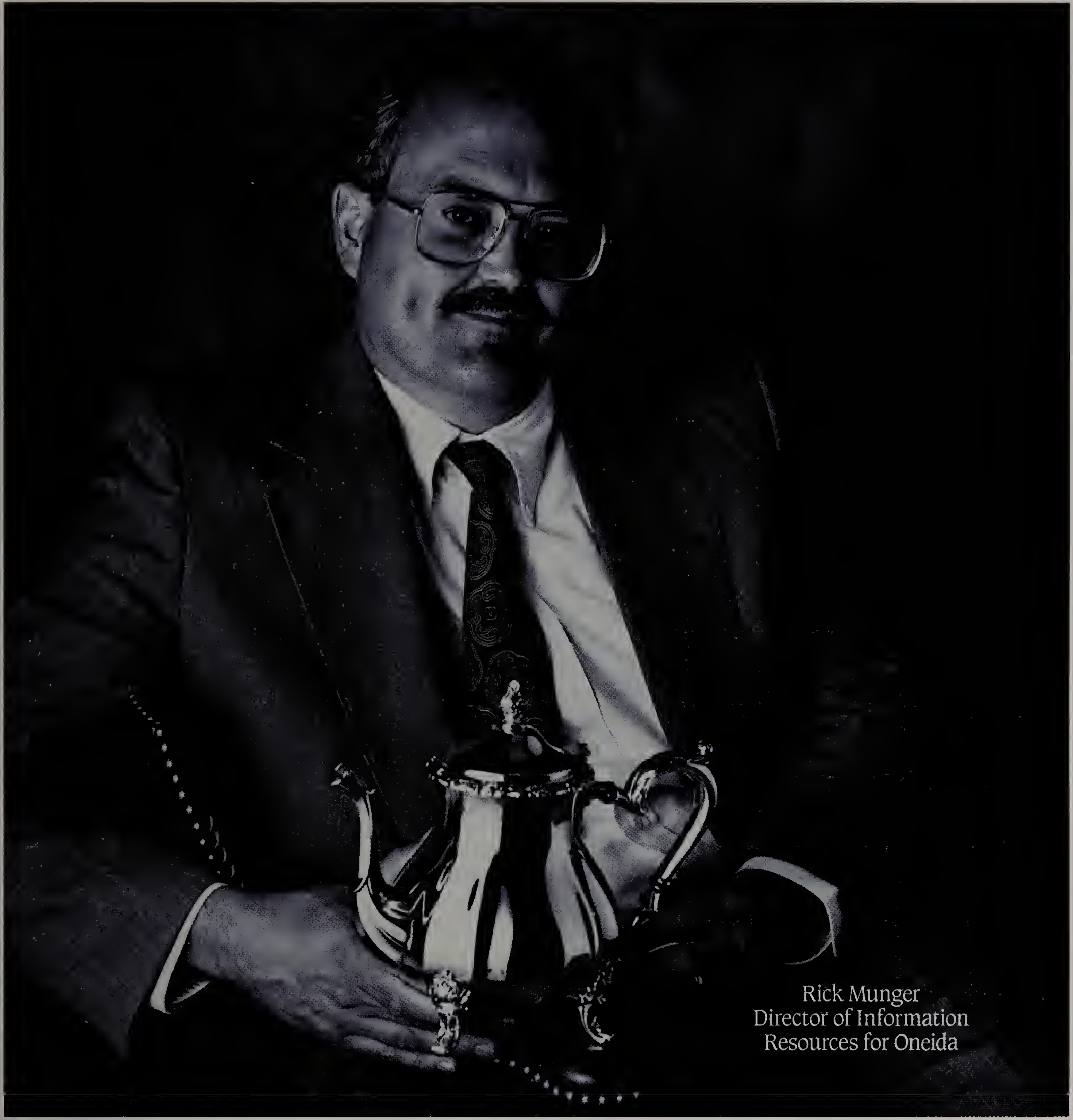
MOST ORGANIZATIONS that want to share video applications over networks will have to wait. While the New England's training program is currently taught from '386-based machines in a training room at headquarters, the company plans to deliver it over its token-ring network once higher-speed wiring has been installed. Colletti would like to include full-motion digital video clips in the networked version, but "the technology to store video on a hard disk for networking is not quite ready," she said.

In addition to data-compression constraints, the main inhibitor to the delivery of image is network bandwidth. Ethernet systems at 10 Mbps may be sufficient for still images and low-quality video, and ISDN offers public switched, wide-area dial-up service for similar applications (Primary Rate ISDN clocks in at around 1.5 Mbps).

A number of high-bandwidth carrier technologies exist today. SMDS (Switched Multimegabit Data Service), a public service for wide area networks, is capable of transmission speeds up to 45 Mbps. And FDDI (Fiber Distributed Data Interface), an optical-fiber-based standard often used for campus-sized backbone networks, runs at 100 Mbps. But even these rates may not cut the cake for full-blown multimedia, which could require the speeds provided by BISDN (Broadband ISDN—up to 150 Mbps) and Sonet (Synchronous Optical Network, starting at 50 Mbps and going up into the gigabit range), as well as the as-yet-unrealized compression ratios of the MPEG format.

Colletti provides a cautionary note for information executives thinking of taking the leap into multimedia. "Our premise is to build what we can now, but in such a way that we can incorporate additional multimedia components as they become stable," she explained. "You have to be practical about what you can do. Nobody will use a system that keeps crashing because it's ahead of its time." CIO

Dennis Livingston is a freelance writer based in Brookline, Mass.



Rick Munger
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THE TIES THAT BIND

BY RICHARD PASTORE

SOMETHING'S GONE WRONG. Last month's employee medical claims are inexplicably missing from Bethlehem Steel's latest database update. Better call the CIO.

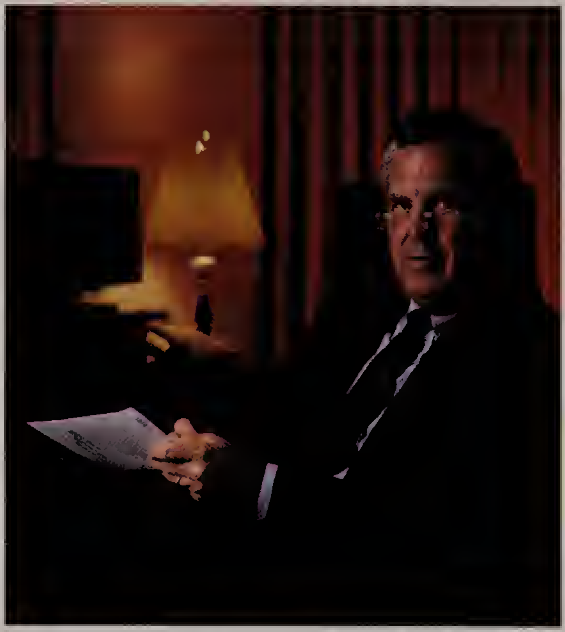
The phone rings, but it's not Bethlehem Steel CIO Walter Bargeron who reaches for the receiver. Instead it's Lowell Starling, corporate vice president for IS at Pennsylvania Blue Shield in Camp Hill.

In this hypothetical incident, Starling would be the one on the spot if Blue Shield's claims system were electronically linked to its Bethlehem, Pa., customer's benefits system. This "borderless accountability" will increasingly beset CIOs as they probe beyond the hedgerows of their own corporate office parks and link informationally with their companies' external customers.

"When you have people in a foreign environment trying to access your systems, if anything goes down between you, their assumption is it's you," said Starling, who has already established links with physicians and other medical-services providers. Nevertheless, he is anxious to do more IS-external customer partnering. Indeed, the current business climate has granted unheard-of clout to the customer: Retail giants already demand EDI links with their suppliers as a condition of doing business. And with prices as low as they can go, customer service is fast becoming the key business differentiator. Consequently, it's incumbent on CIOs to help forge external customer partnerships just as their peers in marketing, sales and other functions have been doing.

STORYLINE

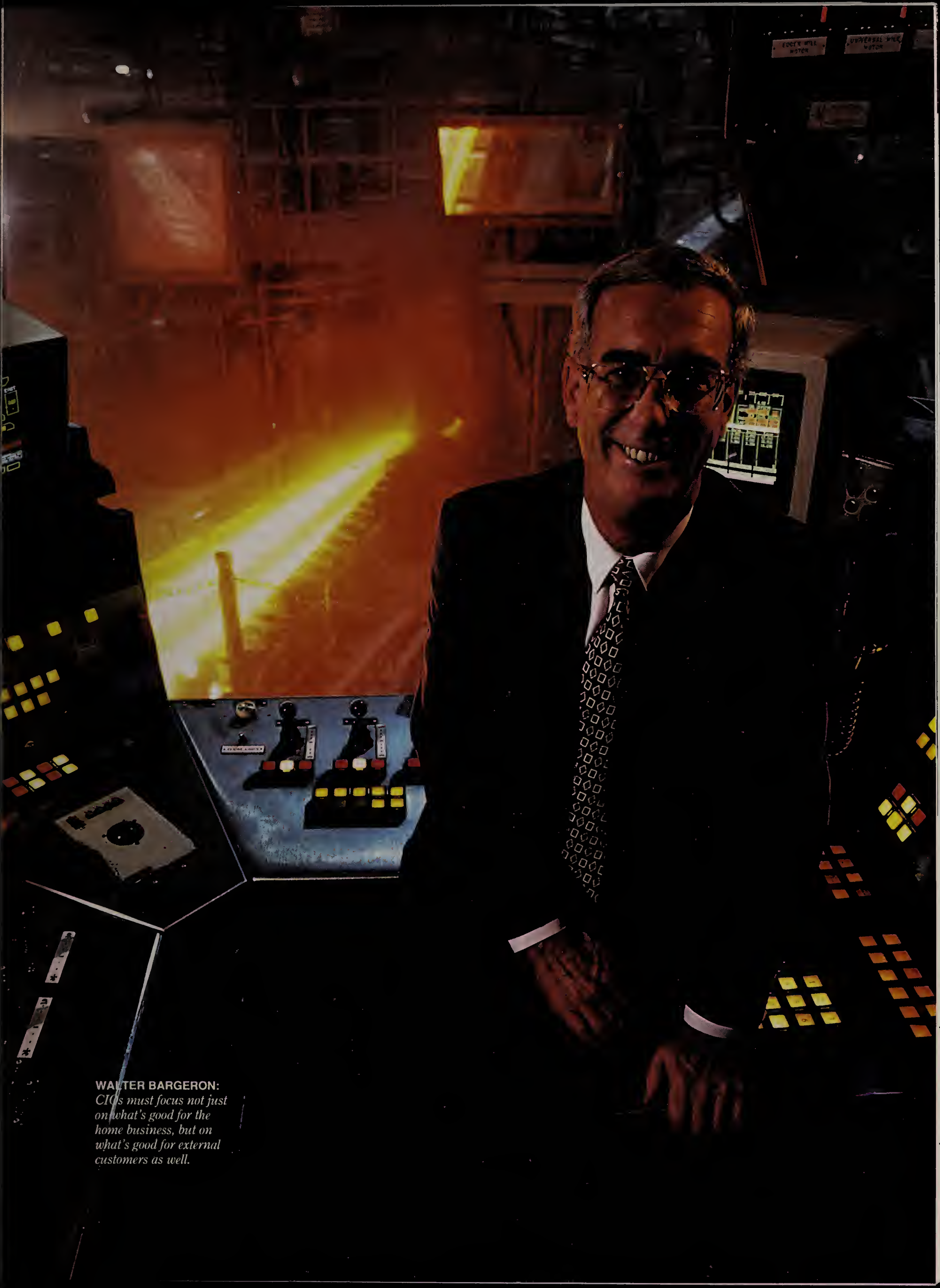
Intercompany IT partnerships take many forms. In the most common, EDI links enable two or more companies to exchange data. In others, a supplier's IS group might design a customer-site productivity system that also makes it easier for the two organizations to do business, or two partners might co-manage a single system created from the merger of once-independent systems. Such arrangements invite security problems and cultural conflicts both at home and abroad, not to mention a kind of "borderless accountability" on the part of the supplier's IS group. But the benefits—higher revenue, lower costs and customer loyalty—make these IS-customer bonds desirable.



LOWELL STARLING: *When companies link informationally with external customers, their CIOs assume a new burden of "borderless accountability." Yet such partnerships are increasingly desirable as customer service grows in importance.*

PHOTOS: LEFT AND RIGHT BY EUGENE MOPSIK

Most often these partnerships take the form of EDI links between cooperative systems that exchange data. In other instances, IS might design a customer-site productivity system that also makes it easier for the customer to do business with the supplier. In more integrated situations, the partners may even co-manage a



WALTER BARGERON: *CIOs must focus not just on what's good for the home business, but on what's good for external customers as well.*

single system created from the merger of once-independent systems. Such arrangements invite security problems and cultural conflicts, not to mention the borderless accountability described by Starling. But the benefits—higher revenue, lower costs and customer loyalty—make these IS-customer bonds desirable.

Unfortunately, partnerships aren't established simply by the CIO phoning up the customer and saying, "Let's swap data." The first obstacle may be simply not knowing whom to call. "I don't have the right contacts to call at our corporate clients," said Starling, who so far has had only limited discussions with human resource and benefits managers at customers like Bethlehem Steel. "If I were to call the VP of human resources and say I want to come visit, all I'd get is a 'huh?' " Instead, Starling has relied on Blue Shield's own marketing managers to introduce him to the proper contacts and chaperone their initial meetings. But this has also been frustrating, since marketing has its own duties and does not view IS-customer introductory services as one of its primary responsibilities.

> **"As the company reaches out to the customer, IS is part of that reach."**
>
> *–William H. Sitter*

A less frustrating approach might have IS as a player on a multidisciplinary team dedicated to working with external customers. Dannon Yogurt fielded such a team earlier this year, staffed with executives from IS, credit, accounts receivable, distribution and financial planning. This group helped design an EDI-based sales information system for the food brokers and distributors that buy Dannon products and resell them to grocery stores. Once the pilot is underway, Dannon's broker customers will have access to more detailed and timely sales data, which they can put to use in sales-volume projections and evaluations of trade-advertising efficacy. Dannon chose the team approach because the system will affect several Dannon business units. "There is no way this would have been successful if it wasn't driven by the users" from the various business units, said Richard Kravchuck, director of strategic information management for the White Plains, N.Y., yogurt maker.

A Symbiotic Relationship

IT partnering may come more easily when the companies involved are both each other's customers and suppliers

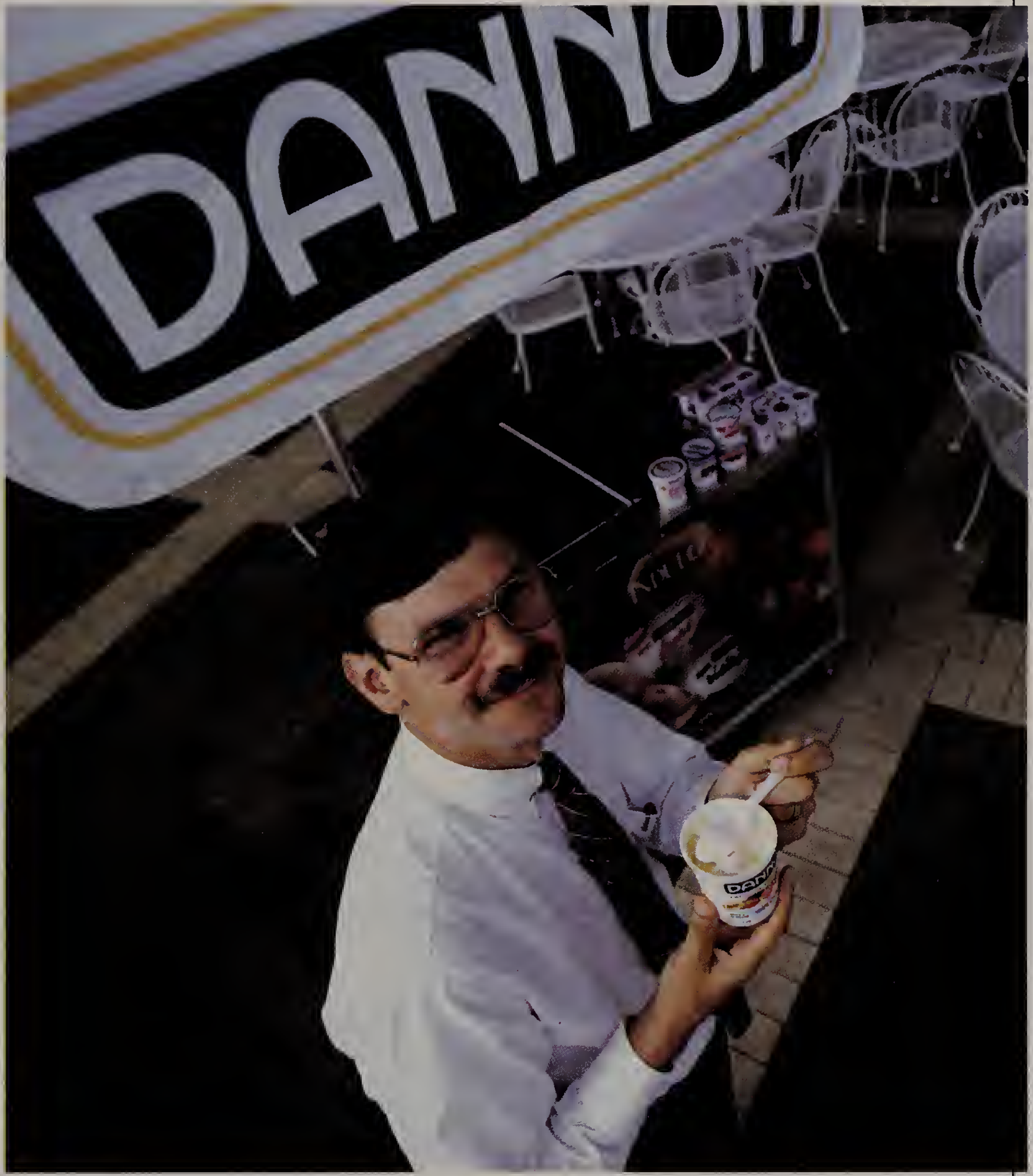
The IT partnership between AT&T and Roadway Services Inc. is a continent-spanning web of crisscrossing EDI lines linking integrated systems. Each firm is both a customer and a supplier of the other, making possible this unusual weave of intercompany IT relationships, a pattern that may grow more common as businesses become increasingly cooperative and interdependent.

The latest strand of this web links Roadway Express Inc. of Akron, Ohio, with customer NCR Corp., the computer vendor subsidiary of AT&T. As a customer of Roadway's freight-shipping services, NCR wanted to set up an EDI link to transmit freight-payment data. The link, which went live this spring, lowers the margin for manual error—thus reducing the fees NCR had been paying to a third party to audit and reconcile bills prior to approving payment. The partners also took a step toward integrating their respective billing systems by adopting the same freight-bill computer code numbers.

Roadway is also converting AT&T's incoming bills of lading into electronic invoices that are transmitted back to AT&T for payment. This system has process and resource repercussions for both partners, according to Gerald Long, vice president of Roadway's IS subsidiary, Summit Information Systems Inc. "It will require changes in our accounting systems and reduce the resources AT&T needs to handle accounts payable and the resources we need to handle accounts receivable."

Reversing its role from customer to supplier, AT&T worked with Roadway to develop an electronic problem-reporting system for its network. Acting as a remote monitor, the system automatically diagnoses glitches as they occur in AT&T Paradyne and AT&T Communications equipment at some 600 Roadway sites. AT&T has proposed a similar system for Roadway's NCR hardware installations, which should help Roadway achieve its goal of diagnosing and repairing at least 80 percent of all NCR system problems within eight hours, said Don Carlson, AT&T national account manager. While this kind of full-circle IT linkage is hardly common for AT&T, said Carlson, "we're trying to do more of this with companies that want to deal in this way."

The AT&T-Roadway partnership has worked particularly well, Carlson said, because of the companies' shared vision. "I was party to a meeting where Roadway's CEO and NCR's CEO went line by line over each other's mission statements," he said. "There was amazing synergy there, and it really works." *–R. Pastore*



RICHARD KRAVCHUK: *Multidisciplinary teams allow several business units to participate.*

PHOTO BY KENT HANSON

AT ALLSTATE Insurance Co., IS is part of a formalized, united front that works with insurance agencies and end customers. "As the company reaches out to the customer, IS is part of that reach," said William H. Sitter, senior vice president and CIO of the Northbrook, Ill., insurer. A member of Allstate's board of directors, Sitter is an equal partner with the other executives running the business, an arrangement he says ensures IS a role in every strategic business decision, including those concerning external customer projects. When an Allstate team discovered that customers preferred to be recognized on the basis of their total volume of business with the insurer, IS revamped a client file system that had been oriented around individual policies, not policyholders. Now agents can call up a customer file and see at a glance all the policies the customer holds across Allstate's product lines.

In a new twist on the team approach, teams at DHL Worldwide Express, a shipping services firm based in Redwood City, Calif., hand off newly forged customer partnerships to senior-executive champions. "We'll try to match the champion with the type of business the client is in so they'll have something in common," explained Wayne Bayliff, DHL's vice president of national and global sales development. For high-tech customers, the executive champion would likely be Michael Lanier, CIO and senior vice president of DHL Airways Inc. For a Big Six accounting firm, the champion might be DHL's chief financial officer, and so on. The customer benefits by having a high-level sponsor and a senior point of contact within DHL.

DHL Worldwide Express's partnership teams turn over newly forged customer partnerships to senior-executive champions.

Whether team member or lone champion, the CIO must adopt and maintain a broader business view to make these external contacts work. CIOs must shed their blinders and focus not just on what's good for IS and the home business, but on what's good for external customers as well, said Bethlehem Steel's Bargeron, who holds the title vice president of technology and quality assurance. This means understanding customers' business goals as well as their technical requirements. On the technical end, Bethlehem Steel maintains a team of a dozen IS staffers to help customers understand and implement EDI technology. Though this represents extra cost for the steel maker, "it's money well spent," said Bargeron, noting that the group's efforts have garnered good publicity for the firm within the industry.

Such high-visibility commitment to external customer satisfaction can't help but generate good relations. Companies eager for customer information linkage earn reputations for responsiveness and flexibility, helping them retain their best customers today and attract new ones tomorrow, according to DHL's Lanier.

SO WHY ARE IS-customer links more the exception than the rule? Aside from the logistical difficulty of establishing communications, two

Right-sizing.

The perfect system isn't

There are trends and fashions even in the logical world of IS, and right now "down-sizing" is a hot one. You read about it all the time, usually accompanied by an obituary for mainframes.

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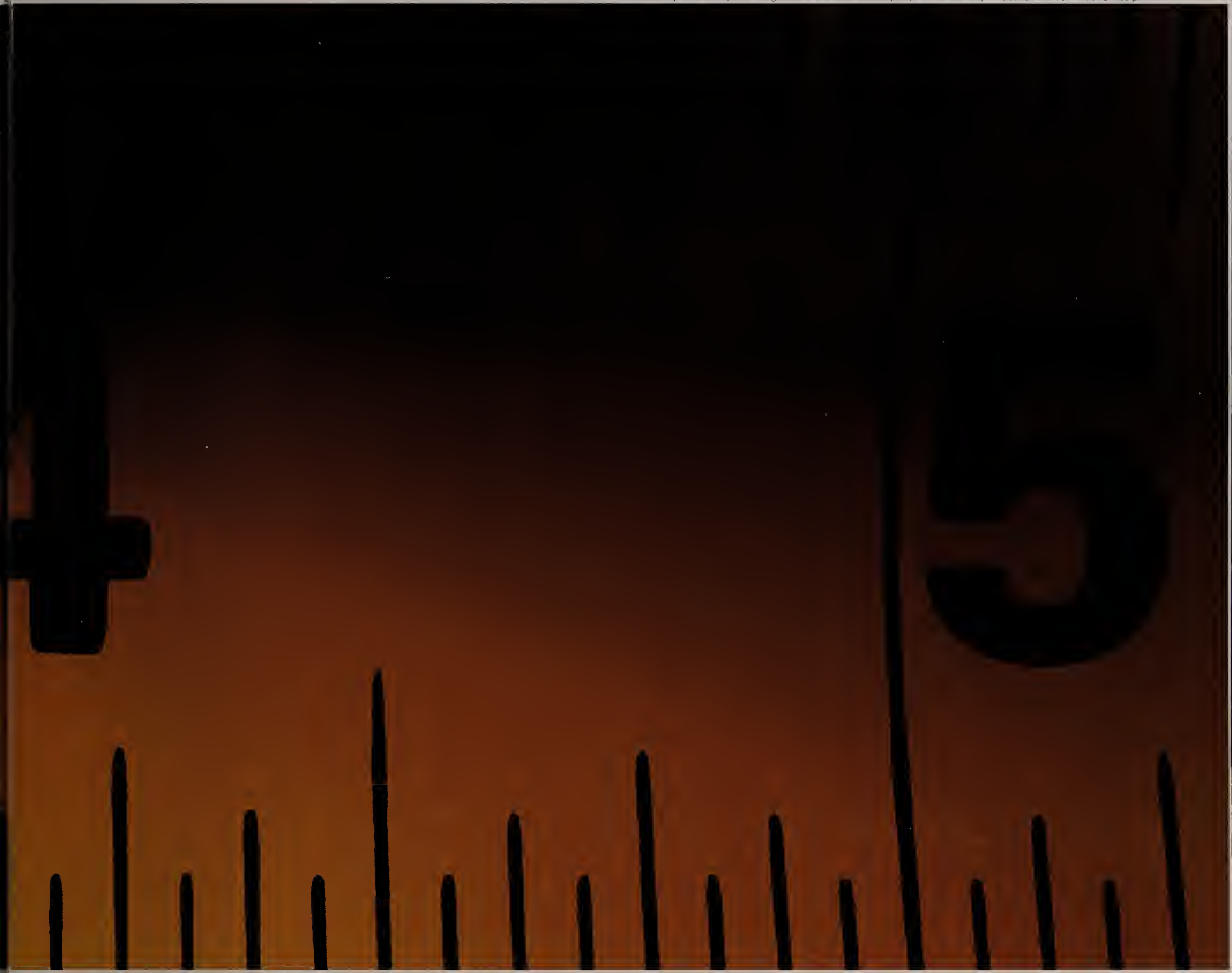

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WAYNE BAYLIFF: *Senior executives are assigned to sponsor customer-partners.*

PHOTO BY ED CALDWELL

main obstacles are cultural conflicts and fear of security breaches. "Three sets of cultures have to change for this to work: internal IS, the business units and the external customer," said Ronald T. Brzezinski, a partner in the Strategic Systems Services Division at Coopers & Lybrand in Chicago. One way to better prepare people for the cultural upheaval is to label the linking effort as a business reengineering project, Brzezinski advised. "A label like that implies right from the start that you will be knocking down barriers and forcing cultural changes."

Security concerns may be unfounded, Brzezinski noted, a vestige of the old adversarial relationship that existed between suppliers and customers. "The sales data you're worried about protecting can be bought easily enough from third parties," he said.

Nevertheless, systems originally designed for internal use will likely need revamping to accommodate external users. All-encompassing databases, for example, may have to be compartmentalized to limit external users' access to specific data. User interfaces may also need modification. Designed originally for internal users, company-unique codes or icons would make little sense to outsiders, noted Bargeron.

CIOs who would consult with customers should also be wary of creating false expectations. "It's easy to sit there and listen to clients enumerate their needs, but you need to avoid leaving the impression you can satisfy all these requests," warned Lanier. CIOs must make it clear that they understand the customer's needs without promising anything that might not be deliverable or in the best interests of their company. Lanier recommends relying on the sales team members for advice on which customers' projects warrant a high priority.

As for borderless accountability, Starling is probably right: CIOs will have to answer not only to internal users, but to external users as well. Yet as Brzezinski points out, accountability is already on the rise for the CIO's peers in sales and manufacturing, functions increasingly beholden to external distributors and resellers. Now IS can shoulder a portion of that burden, with the CIO as ally to both his or her peers and their customer counterparts, Brzezinski said. And that can only make for a stronger company. CIO

Additional Reading

For details on how other organizations are reaching out technically to their external customers, please see the following features in CIO*'s most recent issues:*

Corning Inc.
Corning, N.Y.
Harvey Shrednick, vice president of information services
"Surveying the Field"
January 1992; Page 50

Sears Roebuck & Co.
Chicago
Lance Dailey, director of EDI implementation
"The High Price of Nice"
February 1992; Page 56

Rosenbluth Inc.
Philadelphia
Sandra Carpenter, vice president and CIO
"The Mad Doctor of Corporate Travel"
May 1, 1992; Page 44

Genuine Parts Co.
Atlanta
Tom Braswell, vice president data processing
"Divided We Stand"
August 1992; Page 50

Roadway Services Inc.
Akron, Ohio
"First Person: All in IT Together"
September 15, 1992; Page 26

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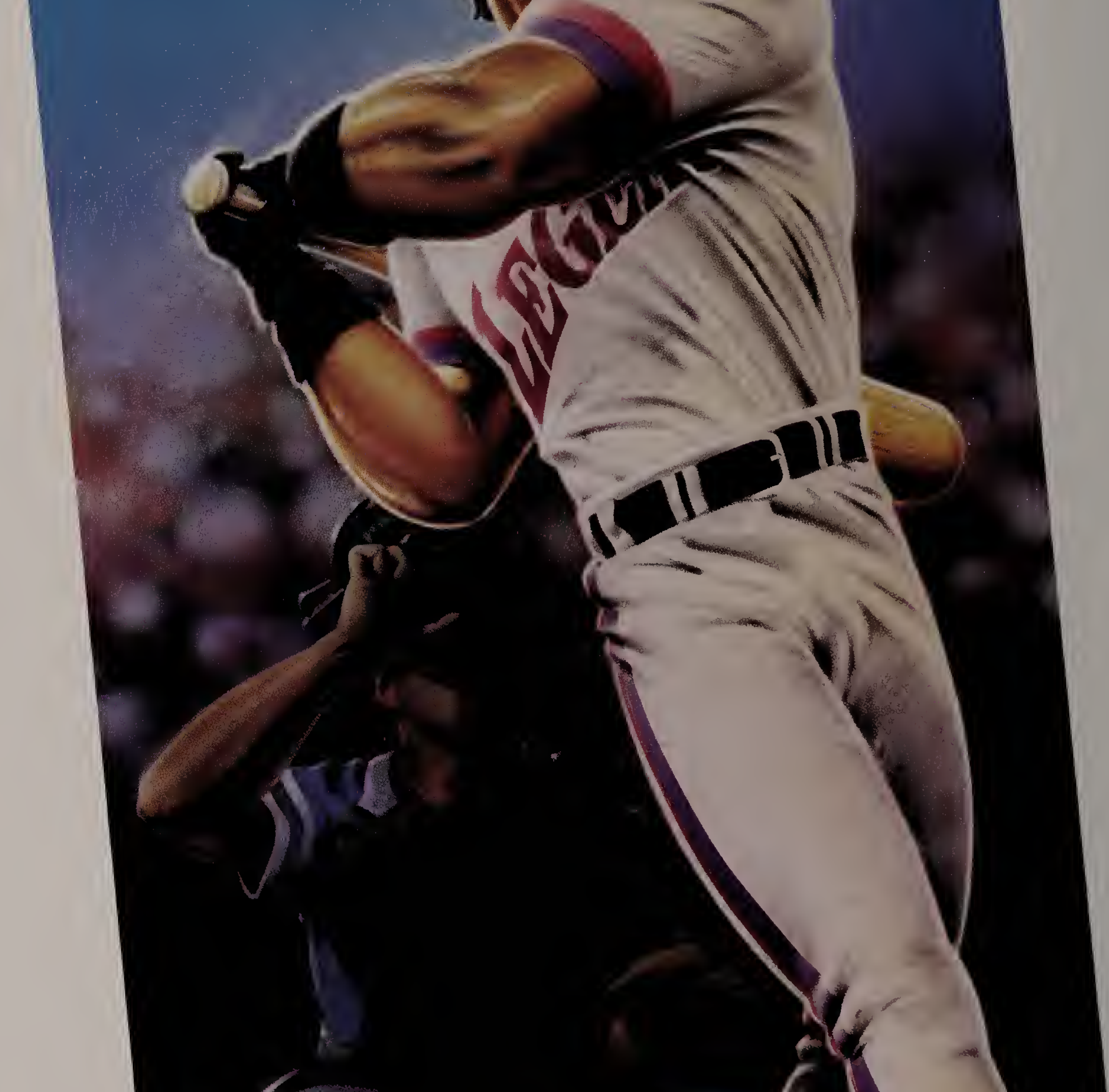
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WORK IN PROGRESS

Client/server pilots are busting out all over, but even the most successful implementations are plagued by hidden costs and problems with retraining, standards and network management

. . . .

BY MEGHAN O'LEARY

Jeffrey B. Tash, president of consultancy Database Decisions in Newton, Mass., offers two words to explain client/server computing: *gestalt* and *Fahrvegnügen*. *Gestalt* because, with regard to complexity and potential, the whole of client/server is greater than the sum of its parts. And *Fahrvegnügen* because the only way to really understand what it's all about is to take it out for a test drive.

Spurred by the need to curb rising mainframe-computing costs; to be more responsive to market forces; and to make the end user more powerful, independent and responsible, more and more CIOs are now attempting to integrate heterogeneous networks into an enterprisewide resource. But they are hampered by the complexity of multiapplication, multiplatform, multidepartment integration—as well as by the dearth of hard client/server standards and sophisticated development and network-management tools. In response, these CIOs are writing

PHOTO BY WEBB CHAPPELL

PAUL HAMEL: *Using client/server as a strategic skateboard to outmaneuver larger competitors*

DAN AMEDRO *expects client/server can stunt the rapid growth of Hyatt's end-user reporting application backlog.*

PHOTO BY NEIL MACDONALD

much of their own communications and interface software and learning how to be creative about administration. So far they are running more on faith and commitment than results.

For many of today's organizations, client/server takes the form of nonproduction, departmental and workgroup applications. The field has more pilots than American Airlines.

At Hyatt Hotels Corp., in Chicago, for instance, Vice President of MIS Dan Amedro is planning to augment Hyatt's Unix environment with LANs that will allow representatives at the company's Omaha reservations center to continue to log reservations centrally while giving them the local processing power to analyze departmental activities and generate reports. End-user reporting is currently Hyatt's fastest growing category of application backlog.

Client/server is equally well suited to environments that require a lot of departmental processing of location-specific data that would slow down a busy mainframe. At American President Companies (APC), a worldwide shipping company in Oakland, Calif., Senior Vice President and CIO James S. Marston is replacing dumb terminals at three West Coast ports with LANs that will han-

CLIENT/SERVER COMPUTING *is a logical concept in which the data, processing and presentation components of network applications are distributed to appropriately sized and powered platforms in a heterogeneous environment where they can be accessed from anywhere in the network. Large amounts of transaction data might reside on a mainframe. A remote server running a departmental application might access that data for users, who would analyze it and generate reports on desktop machines. A GUI would make all of this transparent to the user.*

dle data on local customs regulations and currency conversion. By moving localized information off the mainframe, Marston will give his users faster, more efficient access to centralized cargo-movement information. The client/server environment will also allow a station to send shipment status directly to the next station down the line rather than have it go through the mainframe.

The flexibility of client/server computing can make it a good vehicle for a medium-sized company's mission-critical applications, said Paul Hamel, vice president of systems and planning at Textron Financial Corp. in Providence, R.I. Two years ago, as part of a plan to rapidly develop and offer new financial products and services in its inventory finance division, TFC abandoned a rigid receivables-processing system on the mainframe and moved it to a LAN. "One of the ways we compete against much larger commercial finance organizations is through quality and speed of service to the customer," Hamel said. The company has been rewarded with productivity increases of "at least 100 percent" in this department.

Client/servercomputing can also simplify functions made complex by a multivendor environment. Ameritech Services, a regional bell operating company in Chicago, employs about 9,000 service reps who manually access seven decades-old legacy systems in order to place customer orders, solve problems and answer questions. Today the reps go through several weeks of what is essentially systems-integration training so they can access each mainframe system from several different terminals and deal with stilted mainframe dialogues in order to get information. According to Vice President of Systems Integration John Vaughan, the company is installing Unix servers and NCR workstations that will allow reps to access the systems seamlessly via a graphical user interface. The application has been reengineered so that users can window from one service application to another at the customer's request. Training will take days rather than weeks.

For all its promised benefits, client/server computing comes with a host of obstacles and unanswered questions. One of the biggest areas of confusion is cost (see box, Page 60). Client/server pays off in long-term savings and productivity

Apprehensive New World

Helping mainframe programmers ease on down the road to client/server

From the sounds of it, mainframe programmers are flocking to PC-based client/server programming tools like football fans to a New England Patriots game. Recognizing that the best antidote to fear and loathing may be a little boosterism and individual attention, some CIOs are trying to generate enthusiasm among their staffs for mastering the new skills.

Some are trusting that employees, once given the ball, will run with it themselves. At Hyatt Hotels Corp. in Chicago, for example, Vice President of MIS Dan Amedro will choose a couple of programmers from the company's information services arm, describe an application scenario to them and give them two months to play with some development tools and come up with a prototype application. Cincinnati Bell's Vice President of New Systems Development Douglas Brueckner formed teams of Unix, C and mainframe programmers and let them work together to decide what training each would need to develop a client/server environment.

At D&B Software in Atlanta, Chief Information and Solutions Officer Bill Stephenson sat down with each member of his staff for an individual pep talk, explaining how the technology would enhance employees' productivity and ultimately their careers. While he calmed some fears, he was pleasantly surprised when most of the programmers saw the move as a challenge and rose to it.

James S. Marston, senior vice president and CIO of American President Companies in Oakland, Calif., hand-picked a number of willing programmers, gave them some training and set them loose to unleash their enthusiasm on the rest of the programmer community. "Then people started knocking on our door," he said.

–M. O'Leary

gains; it is not, as many people seem to think, a cost-cutting measure. "Every person we've talked to that's made a full-scale entry into client/server computing has ended up spending more money [than they anticipated] in the short run," said Steve Watson, vice president of marketing for Software AG. "Most think it will take them one to two years to realize any savings."

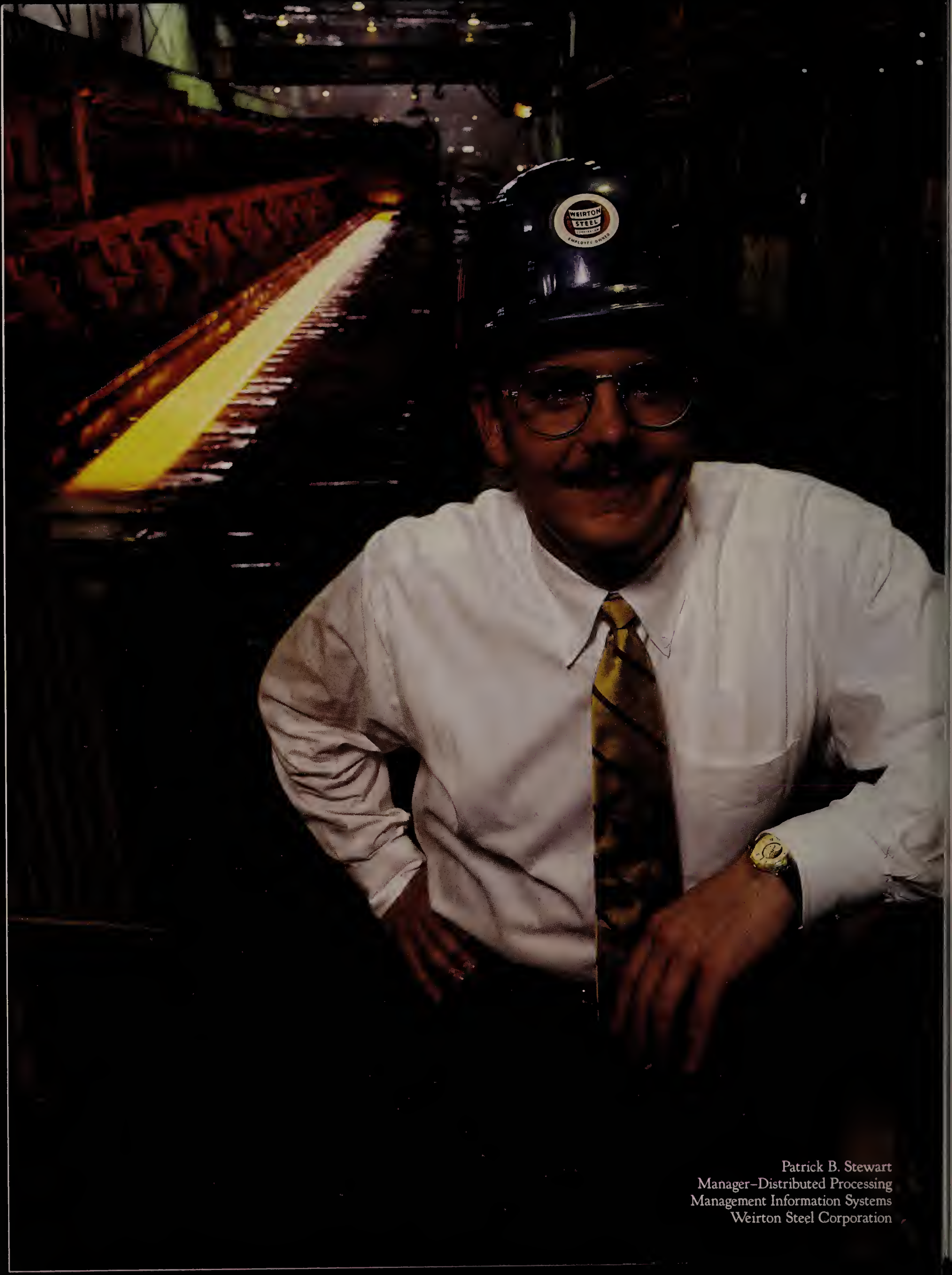
"Cost is definitely a bell curve," agreed Michael Gagnon, senior systems specialist with ITT Hartford in Connecticut. Like other businesses opting for client/server, his company is planning to pay for the purchase and implementation of intelligent desktop machines, additional network bandwidth and communications-infrastructure facilities just to prepare for client/server computing. It will then have to buy tools, build applications and train IS staff and users to use the whole thing. But Gagnon is planning for the long term. "The real advantage is that once you've incurred that cost, you're positioned to compete much more effectively in the marketplace and to maximize the data and process systems you have," he said. "And if I have built an integration infrastructure that really works, I don't have to spend time figuring out how to integrate the next pieces."

Retraining IS staff to build and maintain a client/server environment will be a major expense for most companies, because there is no labor pool of experienced client/server developers. At Cincinnati Bell Information Systems, Vice President of New Systems Development Douglas Brueckner has put 130 mainframe-oriented IS people through six weeks of vendor-sponsored training in object-oriented programming, and he plans to train another 100 by the end of the year in order to facilitate the company's move to a Unix-based development environment. In addition, he is seeding his development teams with what he calls "relatively experienced" new hires who have some experience with client/server. He says that retraining is the biggest struggle of any client/server implementation.

Another stumbling block for would-be implementers is that, despite a growing number of successful implementations, standards and controls are sorely lacking for open systems. This is partly due to the fact that developers of client/server products are still trying to figure out how to make the vision a reality. But many users believe that vendors are also struggling with an attitude adjustment around building products that benefit other vendors. "If I were a vendor, I'm not sure I'd want to build a solution that would enable somebody to go buy another product,"

JAMES S. MARSTON *sees client/server as a way to convey cargo status information without having to pass it through a mainframe.*

PHOTO BY DAVID POWERS



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said Gagnon. "But [as a systems developer] I'm not going to consider a vendor solution that's not going to let me keep my options open."

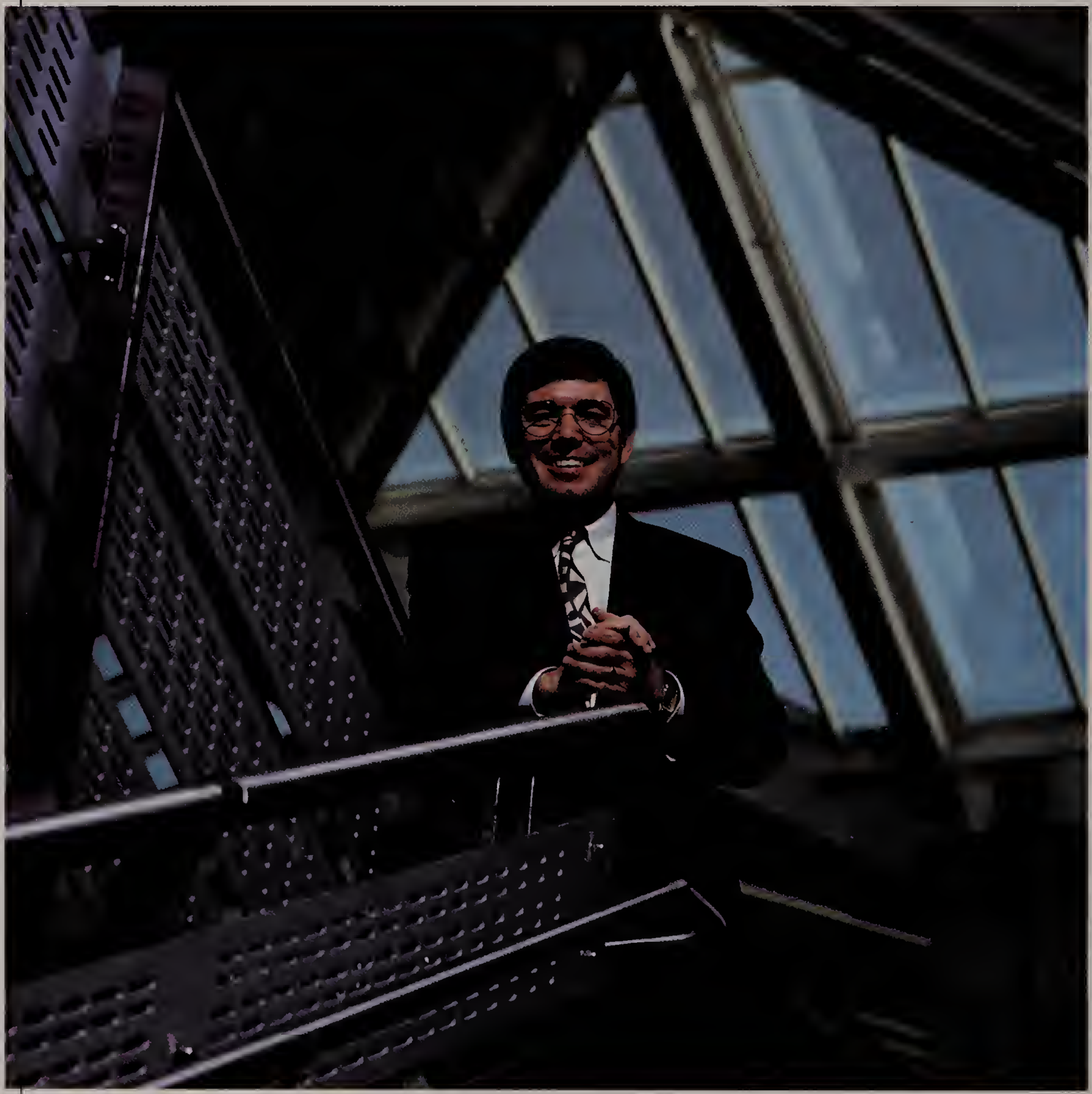
As a result, client/server's backbone of easy communication among disparate platforms is still only a limited, homegrown reality. While powerful PC- or Unix-based tools accelerate the pace of development, they do not address the architectural aspect of client/server. The programmer must still grapple with the physical location of each database and machine and write bits of code to "distribute" the application. Because of the small scale of most client/server applications and the cost of implementation, the majority of systems developers are addressing such communication on an as-needed basis.

DESPITE A GROWING NUMBER OF SUCCESSFUL IMPLEMENTATIONS, STANDARDS AND CONTROLS ARE SORELY LACKING FOR OPEN SYSTEMS.

In the meantime, user companies are creating their own standards. The IT strategy group at ITT Hartford is constructing an entire layer of comprehensive infrastructure services that will provide distribution and communication between every platform the company uses—a sort of highway system "with well-documented off ramps and on ramps," according to Gagnon. It will also allow the business segments to develop client/server applications without worrying about the vehicle that will take them from platform to platform. A separate applications staff in each business unit will help those functions concentrate on meeting business requirements with the application. True client/server computing, according to vendors and consultants, will become available only when infrastructures mature and development tools allow systems developers the same transparent access to resources they're trying to build for users.

Those developers able to handle the communications issues find themselves smack up against a bigger problem—network administration and security. Tools for security, distribution control and administration just don't exist today in distributed environments, explained Darlene Brown, program director of applications development and management strategies for the Gartner Group, a consultancy based in Stamford, Conn.

To fill this gap, APC's Marston has set up teams of technical and business-unit staff to answer questions that emerge during his company's client/server pilot. What kind of applications support will be critical? Where will a local IS support person be necessary to keep business running smoothly in case of trouble? What kinds of tools will the business units need for training and reporting? Which applications and data should each business unit be able to access? By testing tools and prototypes as they plan the pilot, the teams are learning the technolo-



JOHN VAUGHAN *hopes client/server will free service reps from cumbersome mainframe interactions.*

PHOTO BY NEIL MACDONALD

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gy as they go and building corporatewide support for the shift.

In the face of limited funds, the information resources department at Cornell University in Ithaca, N.Y., determined that its administrative priority was version control. So developers wrote a central application that updates each Macintosh in a newly implemented student-information system every time a student logs in and requests a service.

ITT Hartford is counting on its client/server highway system to allow the IS group to better distribute administration, software upgrades and security, as well as applications. Most CIOs agree that full-scale client/server computing will only work if departments have IS people on site.

Unless it is handled impeccably, network management could be the undoing of early client/server applications. The integrity and uniform, bug-free availability of applications—especially mission-critical systems—and data will determine the success of client/server computing in organizations where IS is independently spearheading the effort, according to Jeff Comport, director of product strategy for Integral, a maker of client/server development tools, based in Walnut Creek, Calif.

A Realistic Price Tag

Because of the low cost of microcomputer hardware, George Schussel, president of Digital Consulting Inc. in Andover, Mass., recommends that companies implementing client/server applications "buy the best, buy new and buy extra." The cost of retraining will eliminate any hardware savings anyway.

Consultant costs are "always a big laugh line in my lectures," said Schussel. "But I always tell people to plan to spend more on consultants than you do on hardware, because the hardware budget is only three percent of what it used to be, but consultants are not any cheaper."

Here is Schussel's cost estimate for an initial client/server project:

PROJECT	**COST**
❶ **Software:** DBMS, application-development tool, end-user query package.	**$9,000**
❷ **Hardware:** '486 server with 16MB of RAM and 230MB disk space, OS/2, a token ring card, network cabling, five '486 clients with 4MB RAM and 130MB hard disks.	**$30,000**
❸ **Training classes on site.**	**$14,000**
❹ **Consultant.**	**$40,000**
TOTAL COST:	**$93,000**

Network management troubles may be resolved through strong IS-user partnerships. But Comport believes that anyone who naively expects such relationships to run smoothly or be based on common goals will be unpleasantly surprised by squabbles over responsibility for the budget and for the health of the network. Marston suggested that users may balk at the serious human- and financial-resource commitment required by network administration. Consequently, he advises companies to take their time implementing early applications so that they can get realistic cost estimates and go to the users with hard numbers.

Still, Brueckner does not believe that all programmers must relearn their craft immediately or lose their jobs. The company only has four client/server projects and "we have an awful lot of people still enhancing and maintaining our mainframe products," he said.

Cincinnati Bell's circumstances reflect the facts behind another myth of client/server computing—the mainframeless environment. Most experts agree that mainframes will continue to play a major role in the corporate network—at least for the next 20 years—partly because businesses have a huge investment in mainframe legacy systems that are not easily converted to smaller platforms (see "Redistributing the Wealth," *CIO*, Oct. 15, 1992). And client/server platforms are not yet able to handle massive production or transaction-processing applications efficiently.

"If you liken a mainframe to an aircraft carrier and distributed servers to light cruisers, clearly the light cruisers are more responsive and flexible," Textron's Hamel said. "But a hundred light cruisers do not make an aircraft carrier."

In addition, the Gartner Group's Brown points out that a distributed server architecture is unnecessary for many applications. It would be a waste of time and money to port something like a pure data-entry application to a smaller platform and give it a GUI.

At Cincinnati Bell, the retirement of the mainframe hinges on the robustness of its new Unix servers, as well as on the arrival of tools that will enable IS to break down huge mainframe billing applications into smaller pieces that will work together as one application but run on several lower-capacity Unix servers. The IS department is doing performance-analysis studies to determine where the Unix servers will "gas out."

Even recognizing all of the obstacles and hidden costs, none of the companies surveyed here had any doubts that they would continue to move toward client/server computing. Given the direction of open systems and corporate computing, they agreed, it was just a matter of time. "We backed into this to satisfy our business requirements," said Ameritech's Vaughan. "We had no choice. Like a guy on a burning platform, we just have to jump and make it work."

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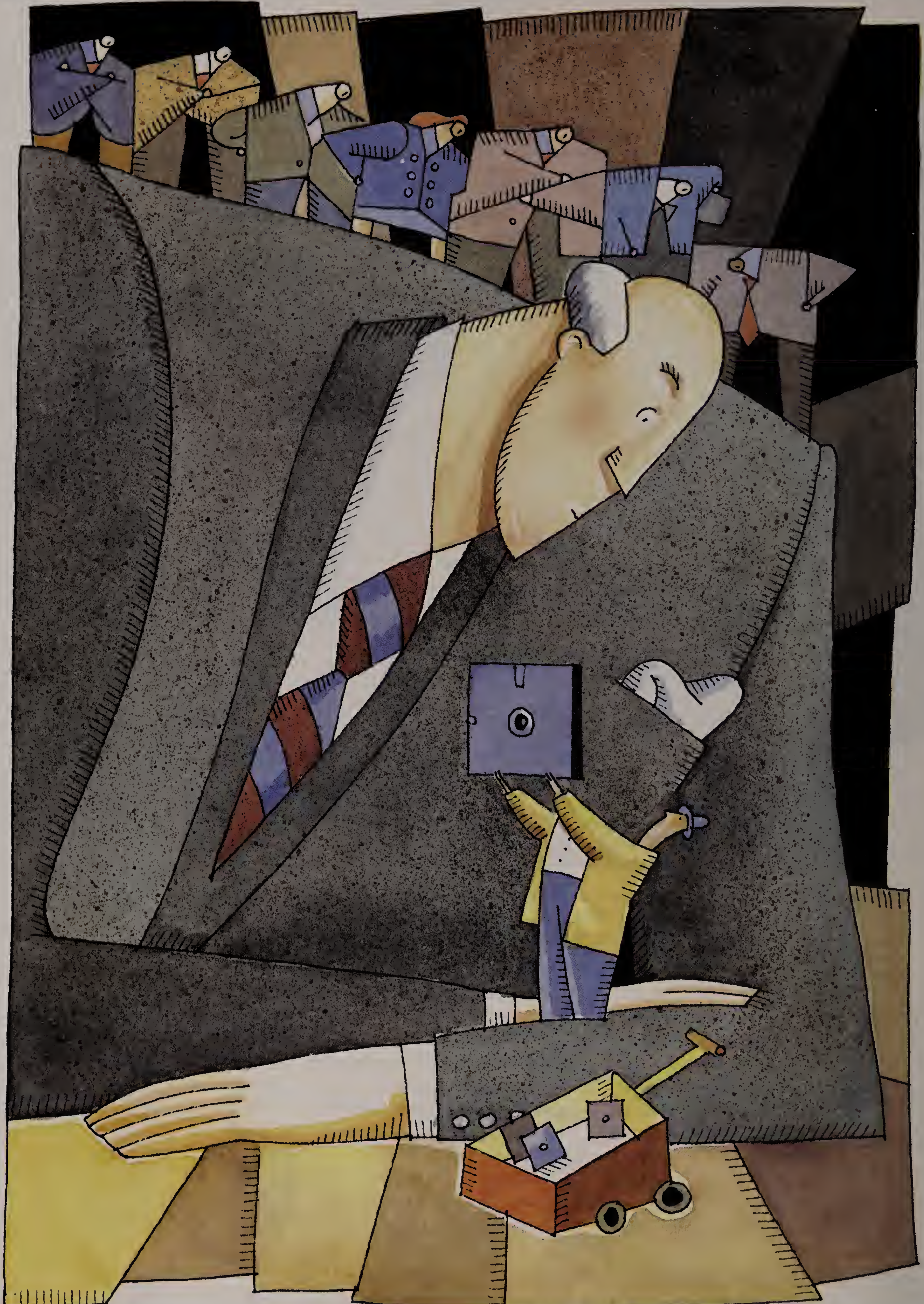


THE UNTRIED AND THE TRUE

Today more than ever, CIOs need techniques to help them minimize the risks and maximize the rewards of dealing with small startup technology vendors

It's hard to imagine now, but even Microsoft and Lotus were once startups. Today's CIOs can look back with amusement at the heebie-jeebies they felt risking dollars and data on inaugural copies of Visicalc. While this fear may seem silly in retrospect, taking chances on entrepreneurial software today is anything but laughable. Perhaps more than ever, CIOs are being forced to gamble mission-critical systems on untested products either to achieve a modicum of competitive advantage or simply because nothing more venerable exists. Thankfully there are several strategies, some common and some crafty, to help minimize the risks and maximize the rewards.

The exponential pace of technology change and the shift to client/server architectures have fertilized the field for entrepreneurial startups and one-product wonders. The migration to client/server is creating "the biggest entrepreneurial opportunity in the short history of computing," said Mitchell Kertzman, chairman and CEO of Powersoft Corp. in Burlington, Mass., and former chairman of the American Electronics Association, a lobbying group for high-tech entrepreneurship. "Everything from security to database management has to be recreated for this new environment."

"The innovations always came from small companies, but the rate of technology is increasing, so we're dealing with more and more startups," said Vaughan Merlyn, partner at Ernst & Young's Center for Information Technology and Strategy in Boston. Indeed, many emerging markets are devoid of established players, leaving CIOs with the uncomfortable options of chancing a neophyte vendor, building something in-house or blowing an opportunity for competitive advantage. Those who have already gambled on startup software and won relied on the following strategies to stack the odds in their favor.

BY RICHARD PASTORE

ILLUSTRATION BY ROBIN JAREAUX

> WE HAVE TO OPEN THE KIMONO BECAUSE WE CLEARLY DON'T HAVE A REPUTATION TO SUSTAIN US.
>
> *–Vincent Kelly*

Manage the system independently of the software. Wherever possible, IS managers should isolate particular products from overall systems by managing not the software itself, but the methodologies and infrastructures that overlie a product's specifications. "Manage the standards, the disciplines and the protocols so if a product becomes obsolete, you can more easily move to another without rebuilding everything," Merlyn advised. Of course, the basis for this strategy is buying software that adheres to standards.

To achieve software isolation and independence, Avis Rent-A-Car System Inc. in Garden City, N.Y., required its new 4GL tool to be platform-portable. The company passed over Unisys Corp.'s offering in favor of a more portable tool from the much smaller Bedford, Mass.-based Progress Software Corp. for use in its latest Wizard reservation system. The resulting system-component independence "will allow us to move the application to another platform if it ever becomes necessary," said Joseph Pittari, Avis's director of systems development. "You don't want to be totally reliant on one component for a whole system."

Investigate the vendor as if you were investing in it, because that is exactly what's happening. A startup probably won't be earning a profit, but it should at least be raising venture capital. Even though the company may not be public, it will most likely agree to reveal its finances. "We have to open the kimono because we clearly don't have a reputation to sustain us," said Vincent Kelly, president of Occam Research Corp. in Watertown, Mass. Prospective buyers also typically ask who is furnishing venture capital and who sits on the vendor's board. "They want to know who believes in us," said Kelly, whose 23-person firm makes MUSE, a natural-language data-analysis tool.

The product itself gets the most critical attention. "I want to know if they've really thought through where the product's going, its position, the platforms they'll put it on and their timetables for getting it there," said Frank Morelli, director of customer support, marketing and management systems within the global business systems group of the Colgate-Palmolive Co. in New York. Even with these reassurances, Morelli likes to have a fall-back, alternative product in mind. A slick but simple way to find this alternative is to ask the startup for the name of its principal competitor.

Ask for customer, vendor and analyst references or referrals. "Buying vaporware is the biggest risk, so we immediately went to a couple of installed sites to make sure the software did exist," said Henry Nahal, director of telecommunications and information management systems for New York State's Civil Service Department. Nahal was one of the first customers of PeopleSoft Inc., a client/server personnel management and accounting applications vendor in Walnut Creek, Calif. "We were able to find out if the product and PeopleSoft had met their timetables and response rates."

Positive coverage by the analyst community and the press can also help allay fears. "I wouldn't bring anything in here unless I had good words from other people," said Richard Levey, wide area network administrator at Pace University in New York. For a mission-critical ad-

In the Driver's Seat

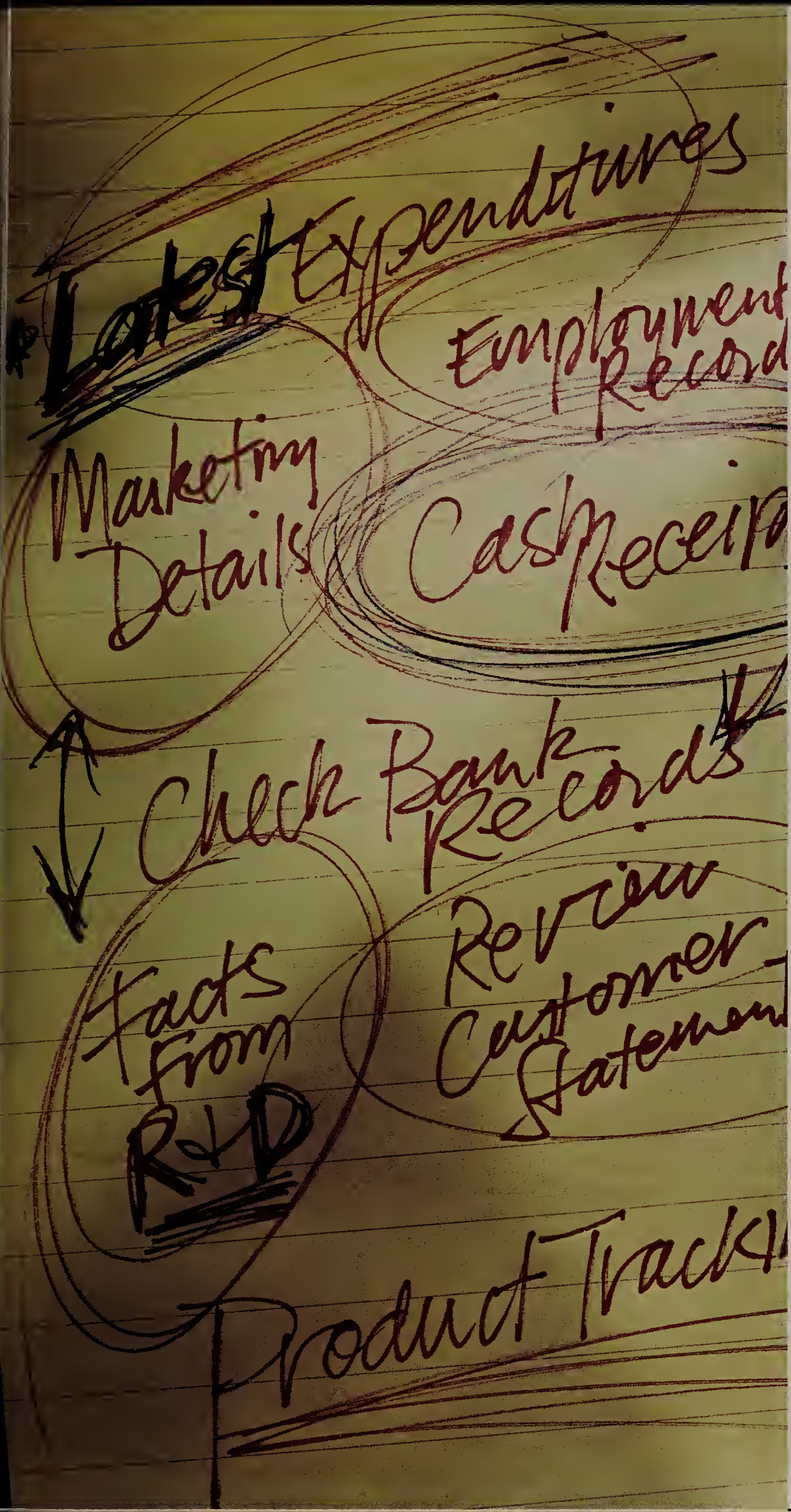
CIOs who work with small startups have more control over the relationship

It's great to have the upper hand, but in customer-vendor relationships, the hand too often favors the vendor. That's not the case when dealing with startup firms. "You are more important to the company than they are to you, and that raises your level of influence," said Neal Hill, a senior analyst at Forrester Research Inc. in Cambridge, Mass.

In many cases, this influence extends to input on product development. In working with startup Occam Research Corp. and its database query tool, Colgate-Palmolive was "able to shape to a large degree some of the functionality we wanted," said Frank Morelli, director of customer support, marketing and management systems within the global business systems group.

Early customers can bask in the glow of attentiveness that only startups can provide. "We got significant attention and resources [from PeopleSoft Inc.] we would not have gotten from a vendor the size of Microsoft," said Henry Nahal, director of telecommunications and information management systems for New York State's Civil Service Department. "We had the personal attention of the president of the company."

Customer influence with startups often results in cost-savings, too. Philadelphia medical insurer Independence Blue Cross, one of the first customers to go online with PeopleSoft's personnel application, was able to negotiate a favorable price with the small firm. *–R. Pastore*



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missions application, Levey took a chance on BeyondMail, an electronic-mail workgroup tool from Beyond Inc. that has garnered a lot of attention from the press and software analysts since the Cambridge, Mass., startup released it one year ago (see "The Mightier Messenger," *CIO*, August 1992).

Big, established vendors, while they are often late entering hot markets, still carry weight when they ally themselves with or recommend a startup. IBM's referral of Needham, Mass., vendor Horizon Strategies Inc. convinced CIO Richard Avery to take a chance on the firm's distributed-computing tool for his company, S.D. Warren Co., a Boston-based subsidiary of Scott Paper Co.

Software entrepreneurs know that big-vendor alliances are their best method of entry into conservative IS shops. "It's a credibility builder," said Kertzman, whose one-year-old PowerBuilder client/server tool is endorsed by Microsoft Corp. and used, bundled and resold by D&B Software. "When they ask me, 'Should I bet my business on you?' I point to D&B."

An exacting contract is the best vehicle for minimizing risk. "We wrote the contract so we don't pay for anything if the software doesn't meet the performance criteria we spelled out," Nahal said. "You have to define everything; the words won't be worth a darn if everyone doesn't agree to what it all means." Nahal, who has a law background, advised IS managers not to attempt to draft the contract on their own. "You wouldn't expect someone in the legal office to design their own LAN, so don't expect that you can draw up a contract without legal help."

The standard contract should set performance and response-time expectations at various transaction volumes. It should also dictate timeframes for bug fixes and penalties for vendor slip-ups.

Obtain guaranteed access to the software's source code in the event the vendor goes bankrupt. Often overlooked, this contract clause can serve as a final safety net. "If you're going to build internal processes around this product, you have every right to have access to, if not outright ownership of, the source code should the vendor fail," said Neal Hill, senior analyst at Forrester Research Inc. in Cambridge, Mass.

Though vendors are reluctant to guarantee code access, "I am adamant about having it in the event of default," said Michael Prince, director of information services at Burlington Coat Factory in Lebanon, N.H. "I won't do business otherwise." Some companies arrange to have an outside party hold the code in escrow for them (see "Support Groups," *CIO*, February 1992).

Establish guidelines or limits on what can and cannot be risked. Some CIOs rely on instinct to help draw the line on risk. While Prince won't take a chance on a startup for something with the wide-ranging impact of a CASE tool, he has gambled on less strategic entrepreneurial communications software and is currently evaluating client/server tools from relatively small vendors.

Others, like Morelli, set more objective limits. "For $3,000 or $4,000, I'm willing to take a chance on a package I think will solve a problem. Beyond that, I have to question whether the value for the price outweighs the risk we're taking."

If resources permit, screen products internally before deploying them. Some large companies, including 3M, have set up internal "bomb squads" that poke and prod new products to ensure they don't later blow up in users' faces. Though it's expensive to fund a separate group of software testers, it could be the best practical solution if users and IS staff lack the time or personnel to do their own inspections.

Prototypes and pilots are the most common risk-reduction tactics, but even these require caution. "Make sure the pilot simulates real life, that it's not running in a utopian environment with utopian constraints," advised Ajit Kapoor, a vice president and director at consulting firm META Group Inc. in Westport, Conn. "You're not trying to test the system; you should be testing how well your work runs on this system."

For many IS managers, these tactics and plain good judgment have fashioned successful track records in dealing with startups. "We're well-aware of the risks," said S.D. Warren's Avery, "but we've done this before and it's turned out well: We took a chance several years ago on a company called Novell." Perhaps if the PeopleSofts and Powersofts of today become the Novells and Microsofts of tomorrow, CIOs may someday smile over their former fears. But for now they seem content to be cautious, and rightly so. CIO

RISK MANAGEMENT

How to improve the odds when gambling on a startup's software

- Buy products that adhere to standards.
- Maintain product independence by managing at the methodology level, not the product-specification level.
- Investigate the vendor's finances, leadership and backers.
- Follow up customer references.
- Look for referrals from established vendors.
- With legal assistance, draft a contract that specifies the vendor's responsibilities and accountability.
- Demand access to the product's source code in event of vendor bankruptcy.
- Set objective limits on the costs or areas that can be risked.
- Screen products before deploying them.
- Conduct realistic pilots.

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Beware the Copy Cops!

You may be breaking the law and not even know it. Companies without stringent anti-piracy programs in place risk a costly raid by the Software Police.

BY DEMARQUIS WALLS

ILLUSTRATION BY JIM CARSON

On the way out of a marketing presentation, you overhear a newly hired financial analyst asking the marketing wiz how she generated the visuals for the meeting. "I did it on my PC," replies the marketer. "I'll give you a copy of my Spread-O-Matic software. I don't have a user manual, but it's so easy you don't need one. Everybody in marketing loves it."

Get ready for a raid by the Software Cops! While there's nothing wrong with one person helping another, in this instance the help will probably come in the form of "bootlegged" software. Commonly known as "softlifting," this duplication of PC software violates U.S. copyright laws. Those laws have teeth: A single copyright infringement can result in civil damages of up to $100,000.

If you purchased a single-user copy of a spreadsheet program and have it installed on several PCs, those copies are illegal. If you borrowed a copy of a licensed software application and have not purchased your own, you are breaking the law. The Software Publishers Association, a non-profit trade association of the PC software publishing industry (also known as the "Software Cops"), may be talking to a federal judge in your area. It could get an injunction or a court order to search your premises and seize illegal copies.

Since the evidence is easy to erase, the SPA usually relies on surprise to catch software pirates. Tomorrow's coffee break could be interrupted by an unwelcome visit from an SPA representative with an armed U.S. Marshal in tow.

Don't think it couldn't happen to you. The SPA is the copyright-enforcement arm of most major U.S. software vendors, with a mandate to improve compliance and responsibility for prosecuting unapproved software duplications. It has mounted a vigorous anti-piracy education and media campaign with the goal of increasing sensitivity to this issue in executive suites and IS departments. It has coupled this awareness program with an equally vigorous prosecutorial campaign.

Based on calls from current or former employees and other sources, the SPA has sued or raided over 100 companies in the last three years. It currently has dozens of organizations under scrutiny, and an average of two violators a week are being prosecuted.

The copyright law protects software vendors' investments by prohibiting the use of their products without permission. When you buy software, you are really buying a license to use a copy of the program. The ease of making additional copies presents a real problem for publishers. In essence, the PC's operating system is a manufacturing plant that turns out perfect duplicates. So any user can become the equivalent of a non-profit software distributor.

DAMARK International Inc., a fast-growing catalog retailer, last year reached an out-of-court settlement of a software copyright-infringement case. Over the last few years, our PC population had grown faster than our knowledge of copyright laws. It had become common for one PC user to copy software from another rather than buy a new copy. It never occurred to us to teach

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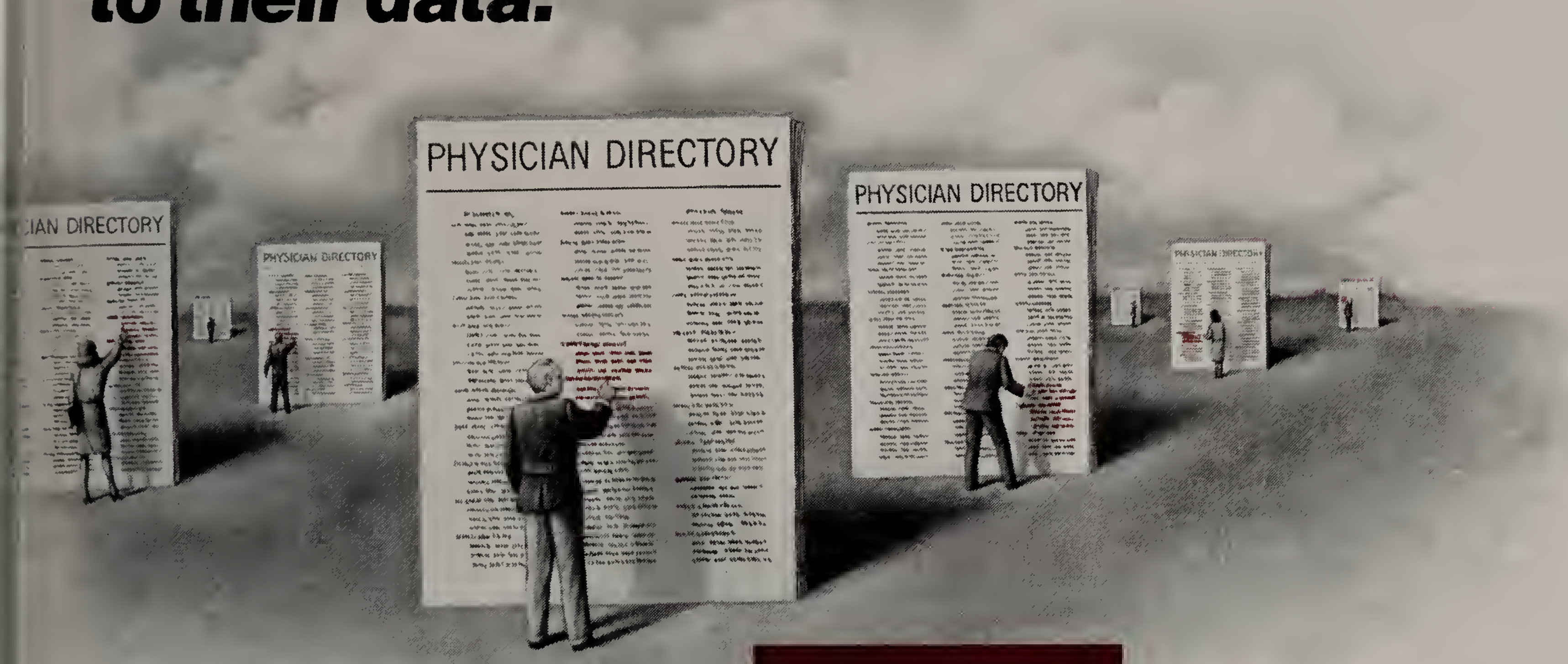

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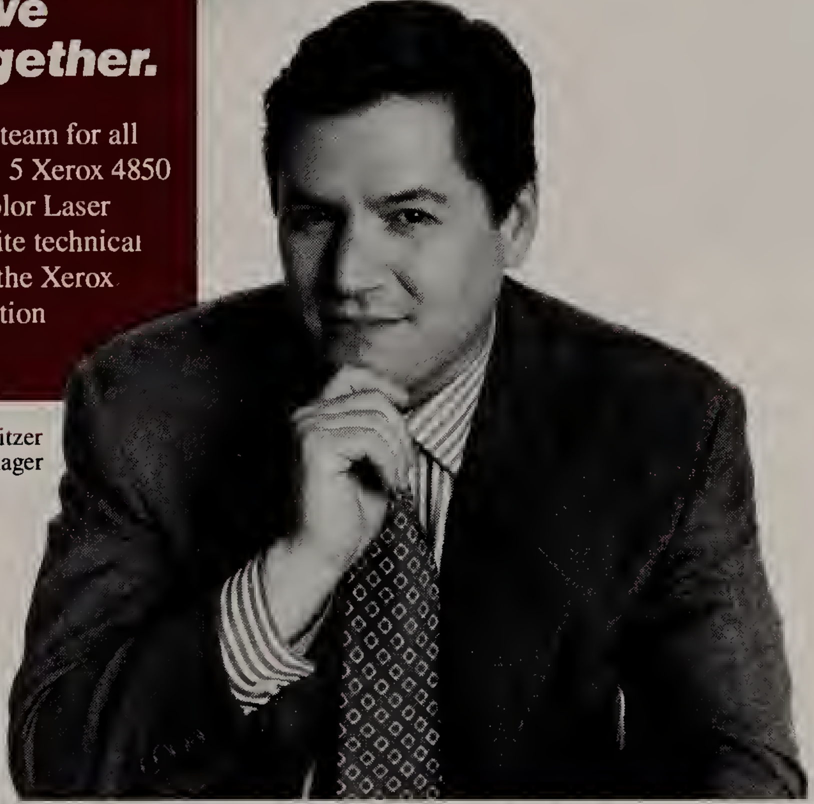

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It's a service their customers especially appreciate. And the company appreciates how the 4850 is the most cost-effective way to add color to variable data without incurring the prohibitive costs of offset printing. Not to mention the savings they enjoy by eliminating preprinted stock, reducing warehousing costs, and improving turnaround time.

If putting together results like this would stand out in your business, call 1-800-TEAM-XRX, ext. 609B.

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our users about software copyright-protection laws. We didn't have a software policy or sufficient controls.

Last year, a former employee called the SPA's 800-number Piracy Hot Line. As a result, the SPA filed a copyright-infringement complaint against DAMARK. We cooperated fully, voluntarily sharing information with the SPA's attorneys and providing lists of the software in each PC and our documentation. In short, we tried to show that our infringement was not deliberate.

After an intrusive investigation, several depositions and healthy legal fees, we settled the case. The cost to us included the purchase of proper software licenses, lost work time, legal fees and a settlement paid to the SPA's Copyright Protection Fund.

Companies that want to avoid such cost, embarrassment and lost time should take this test to see whether they are likely targets for the SPA:

- Does your organization have a published policy statement educating employees about software copyright infringement? Does it prohibit them from making or accepting unlicensed copies of PC software?
- Is there a set of original user manuals at each PC workstation where a software product is installed? Is there a set of original manuals for each set of executable floppy disks?
- Is the purchase, installation and license registration of all PC software controlled at a central point in your company?

If you answered "yes" to all three questions your PC software installations are probably legal. If you answered "no" to even one, you may be violating federal copyright laws. The following plan will help to ensure that you are in compliance with those laws.

Educate management about copyright infringement. Send a memorandum on software piracy, composed with your legal counsel, to all managers. Explain how easily copyright infringement can occur and include a policy statement on the acquisition and use of software. If possible, place acquisition responsibility with one organization or individual.

Based on calls from current or former employees and other sources, the SPA has sued or raided over 100 companies in the last three years.

Determine what software you are using now. Perform an audit to develop a list of all software installed at your company. The SPA will provide you with a free software package called SPAudit. SPAudit will search your systems for about 700 products of SPA members and gather and print an index of executable programs from those systems. (For a copy of SPAudit, write the Software Publishers Association, 1730 M Street NW, Suite 700, Washington D.C. 20036-4510. Or call 202 452-1600 and ask for the Self-Audit Kit.)

Gather purchase documentation. Gather all documentation and records of purchased software. Collect invoices, purchase orders and checks. If your records are incomplete, seek help from your software retailers.

Review registration records. Check your legitimate software to see that the license is registered with the vendor. Vendors keep records of customer registrations for maintenance and troubleshooting support and will provide a list of your company's registrations. (The SPA may check registrations to determine if you are in compliance.) If you own software you haven't registered, contact the vendor immediately.

Consider standardization. Choose one product for each type of activity. An environment with one word-processing product is naturally easier to control than an environment with three products from different vendors.

Develop a requirements list and determine compliance. Compare your list of installed and available software with your purchase records. Match each installed software product with a purchase trail. If you can't prove legal purchase, add that product to your requirements list and replace it. Use lists of purchase records and installed products to develop a list of requirements.

Destroy illicit copies. Delete invalid installations from your PCs' hard disks and destroy illegitimate copies on floppies. Make sure that employees are aware of the deletions; some may have purchased and rightfully installed software on their PCs for their own use.

Install new software. When installing the legal copies, try to centralize the installation function in order to keep it under control. As you install each product, update your records to tie its serial number to the specific PC or server.

If you have a PC coordination function, keep the original diskettes for the software in a centralized location. Once you have installed the software, users should back up their entire systems. Label the backup diskettes with a "Contains Copyrighted Materials—Do Not Copy" warning. Once this is done, users shouldn't need the original diskettes, reducing the chance of anyone creating unauthorized copies.

Register all software. Send in the registrations for every copy installed so vendors can provide better troubleshooting and hot-line support and alert you to critical software problems and upgrades. Also, their databases will act as a second record of your ownership.

Establish an annual software audit. Set up an annual software audit of all PCs to ensure that your organization sticks to its policies and procedures.

Of course, you may be a risk-taker. You might decide to ignore the problem or give it a low priority. But that would be a mistake. You never know when the Software Cops will come knocking. CIO

DeMarquis Walls is vice president of information systems and technology at DAMARK International Inc., a catalog-sales company in Minneapolis.

Enterprise Networking

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FYI

View Master

A new telecommunications product might be just the thing for people who still cling to the adage that seeing is believing. VoiceView from Radish Communications Systems, of Boulder, Colo., is an integrated voice and data system that enables telephone callers to exchange textual data visually during a conversation, without the use of ISDN.

Voice and data transactions are conducted over a single telephone line using standard telephone equipment and the existing telephone network. VoiceView consists of a Viewset (a standalone desktop LCD viewing screen that can be used in place of a PC by callers to view transactions), Viewbridge (which links the telephone, telephone line and PC for data transmission) and Viewware (the software enabling a PC to send and receive data over a phone line).

The system is useful in such applications as banking inquiries and travel information. VoiceView can also receive visual messages while unattended. Starting price for a standard system configuration, which includes five MS-DOS agents and 50 callers, is $27,995. For more information call 303 443-2237.

Connect the Blocks

Programmers who still savor the memories of their first ultra-deluxe Lego set will appreciate XShell. This new product from Expersoft Corp. is a distributed object-oriented system-development environment that allows software professionals to construct large-scale systems of cooperating programs across distributed networks.

Written in C++, XShell's object-oriented module-interfaces provide transparent network communications among system building blocks. Since XShell modules see each other as though they were local software objects even if they are actually running on different computers, developers can more easily exploit the computing resources of the entire network to solve large problems.

The XShell integrating framework supports the composition and control of cooperating systems of XShell modules, allowing the system architect to distribute modules across a network, configure their communication pathways and control the operation. The development framework includes a set of optional toolkits that support advanced problem-solving techniques—including rule-based systems and fuzzy logic.

XShell is priced at $10,000 for each of the first five workstations and $5,000 for each additional workstation. Each toolkit costs $2,000 for the first five workstations and $1,000 for each additional workstation. For more information call 619 546-41003.

Imaging for the Masses

While document image archival/retrieval database technology has been available for several years, the software and equipment have been prohibitively expensive for most small and mid-sized businesses. Binary Research Inc.'s EasyImage lets users scan, store and access hundreds of thousands of documents at less than half the cost of previously existing systems, according to the company.

EasyImage runs on a '386-based PC under all popular operating systems, has full windowing capability and is compatible with most LANs. It allows for multiple image databases and offers point-and-click search, retrieval and manipulation of stored documents.

EasyImage will accept documents scanned in TIFF or PCX graphical formats or created with most popular word processing software. An "in-tray" enables temporary storage of images. Updatable "paste-on" memos can be attached to and retrieved with documents. Cost is $1,000 for one PC; $500 for each additional node. Call 215 233-5300.

A New Twist on Wireless

For shop-floor workers, mobile supervisors, or anyone else who can't sit at a desk all day, mobile telephones are almost a must. But analog cellular, cordless technology is subject to static and security invasions. Sprint hopes to remedy this with its combination digital radio and wireless phone system, the Premier Microcel. With this phone, mobile office workers can accept or place calls while roaming a 50,000-square-foot area. The radio signal can beam through walls and windows without losing clarity, and built-in security encryption stymies would-be eavesdroppers listening on the same frequency.

Besides having greater mobility, wireless users are more productive and can avoid phone tag. Long-distance bills may be reduced since as much as half of a company's telephone volume is return calls placed by workers who were unavailable to receive incoming calls.

Microcel incorporates several business telephone niceties: multiple lines, conference calling, hold, intercom, redial, speed dial and volume adjustment. There's even a "do not disturb" setting. The system costs $750 to $1,000 per station, which can serve up to 24 handsets. For more information, call 202 828-7411.

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An EDGE on the Competition

By building an automated loan-origination system and making it available to loan officers nationwide, independent mortgage banker Countrywide Funding greatly increased the number of loans its officers could handle while slashing the time needed for approval

Most homeowners know that the paperwork required for a mortgage can bog down the application process. As COO of independent mortgage banker Countrywide Funding Corp., Stan Kurland wanted to grease some wheels by automating the loan-origination system. He figured this would give his company an edge over competitors by improving communications and relieving loan officers of many of their paperwork burdens. Since rolling out the new system—appropriately named EDGE—in 1990, Countrywide has dramatically reduced its average loan-approval time and realized a tremendous growth in business, both without significantly adding to its payroll.

Countrywide, based in Pasadena, Calif., maintains 157 retail branches and wholesale centers throughout the United States. The company originates, sells and services loans for single-family homes. Before EDGE, loan officers wrote down application information, typed it into a PC and printed it on one of 1,100 different forms. Identical information needed on more than one form had to be retyped. Information was transmitted between remote locations and headquarters electronically via a third-party bulletin board service, which proved to be slow and expensive.

"The old loan-originating system just couldn't keep up with our growth plans," said Dan Garcia Sr., the executive director of application support who worked on EDGE from planning through rollout. "The cost of transactions was too high to support expansion."

Garcia and the IS staff had the task of developing an automated loan-origination system that would enable data to be centralized and controlled in Pasadena. The main goals were to eliminate loan officers' need to fill out multiple forms and to provide them with timely, consistent data.

Establishing a PC-based communications network relying on dial-up technology was the best solution; Garcia and his staff worked exclusively on development for one year. The result is a nationwide network of OS/2-based PCs, LANs and laser printers connected to central AS/400s. Two RemoteWare servers from XcelleNet provide the communications link between headquarters and remote locations. Information is automatically transferred onto whatever forms are required.

Loan officers now spend less time on paperwork, and more time overseeing loans. According to Garcia, officers can handle up to 840 loans, compared to the industry (and Countrywide's previous) average of 650. In addition, EDGE automatically calculates interest payments, prompts users for required information and provides audit checks. As a result, the average loan approval time is under 30 days, compared to the 45 days the Mortgage Bankers Association in Washington says it takes competitors. With more accurate information, Countrywide's rate of delinquent loans has also dipped below the industry average.

All of this streamlining contributes to Countrywide's bottom line. Monthly charges for bulletin boards have been reduced from $55,000 to $5,000. Much of the $1 million spent annually on printing, shipping and storing forms has also been saved.

More productive loan officers can now support a growing business. For the first quarter of the 1993 fiscal year alone, business has increased 261 percent over the last quarter of 1992. "We've maintained production costs and added few people in response to the increased volume," said Garcia.

–Megan Santosus

VITAL STATISTICS

Organization: *Countrywide Funding Corp., Pasadena, Calif.*

Application: *Automated loan-origination system*

Sponsor: *COO Stan Kurland*

Technologies: *OS/2-based IBM PCs connected via LANs, IBM laser printers, two XcelleNet servers, and two IBM AS/400 minicomputers*

Scope: *Loan officers at 157 branch offices and wholesale divisions nationwide*

Objective: *Centralize data, improve communications and eliminate redundancy*

Payoff: *Improved productivity; reduced communications costs, loan-approval time and rate of delinquencies*

Value Added: *Facilitated significant growth in market share without the need to hire a corresponding number of employees*

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